ADVISORY COMMITTEE ON OUTCOME ASSESSMENT IN CARDIOVASCULAR CARE

Report of the Long Term Issues Subcommittee

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MARYLAND HEALTH CARE COMMISSION

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ADVISORY COMMITTEE ON OUTCOME ASSESSMENT IN CARDIOVASCULAR CARE

FINAL REPORT ON LONG TERM ISSUES

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EXECUTIVE SUMMARY

One of the key issues in anticipating the future requirements of a system of specialized cardiac care services is to assess the likely impact of trends that will shape the future health care environment. Those trends include the potential impact of advances in the diagnosis, management, and treatment of clinical and sub-clinical heart disease.

Data reported by the American Heart Association in *Heart Disease and Stroke Statistics-2004 Update* indicate that, based on 2000 age-adjusted death rates per 100,000 population (including District of Columbia and Puerto Rico), Maryland ranked 32nd among states for total cardiovascular disease, 30th for coronary heart disease, and 32nd for stroke. Although many of the risk factors for coronary heart disease, including gender, age, and family history, cannot be altered, there is considerable evidence associating certain lifestyle factors with an increased risk of developing heart disease and that modifying these risk factors with lifestyle changes and medication will reduce risk of cardiovascular disease. The increased emphasis on and recognition of the importance of healthier lifestyles have clearly played an important role in contributing to the declines experienced in heart disease mortality rates. Despite this encouraging trend, it is likely that heart disease will remain a leading cause of death and disability for the foreseeable future.

The Subcommittee on Long Term Issues was formed to assist the Advisory Committee on Outcome Assessment in Cardiovascular Care in identifying topics for additional study and developing proposals to address key policy issues in cardiovascular health and disease: racial and ethnic disparities in cardiac services, primary and secondary prevention, risk factor detection and treatment, early identification and treatment of heart attacks, and treatment of patients after ischemic events. The 17-member Subcommittee on Long Term Issues, chaired by Eugene R. Passamani, M.D., met six times between June 2002 and January 2003.

The Subcommittee on Long Term Issues recommended that Maryland establish the target to:

➢ *Rank 24 or less among states arrayed from lowest to highest in age-adjusted death rates for total cardiovascular disease and for coronary heart disease by 2015.*

Other recommendations of the Subcommittee on Long Term Issues are summarized below:

➢ *Develop a statewide educational program designed to increase awareness of the importance of preventing and controlling hypertension.*

Lead Organization: Department of Health and Mental Hygiene (DHMH)
Partners: State Advisory Council on Heart Disease and Stroke, Maryland Employers, Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate, Medical-Chirurgical Faculty of Maryland, Area Health Education Centers, Health Plans

> *At the community level, develop and implement programs that result in increased physical activity, healthy weight, moderate alcohol intake, and consumption of a diet lower in sodium content and higher in fruits and vegetables and low-fat dairy.*

Lead Organization: Department of Health and Mental Hygiene (DHMH)
Partners: State Advisory Council on Heart Disease and Stroke, Maryland Employers, Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate, Medical-Chirurgical Faculty of Maryland, Area Health Education Centers, Health Plans

> *Establish an annual award to recognize outstanding Maryland programs dedicated to primary prevention of heart disease in both the public and private sectors.*

Lead Organization: DHMH
Partners: Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate

> *Through the utilization of existing and on-going statewide cardiac arrest data, develop a strategy to increase the number of Maryland residents with access to automated external defibrillation at pre-identified high-risk public locations.*

Lead Organization: Maryland Institute for Emergency Medical Services Systems
Partners: DHMH, Medical-Chirurgical Faculty of Maryland, American Heart Association-Mid-Atlantic Affiliate, Maryland Health Care Commission

> *Support a collaborative research project to study approaches to improving the management of congestive heart failure.*

Lead Organizations: University of Maryland School of Medicine, Johns Hopkins School of Medicine
Partners: Maryland Hospital Association, Maryland Health Care Commission, Medical-Chirurgical Faculty of Maryland, Health Plans

CARDIOVASCULAR HEALTH STATUS

Indicators of the health of a population or group include measures of risk factors, morbidity, and mortality. Heart disease and stroke are the number one and number three causes of death, respectively, in both Maryland and the United States. The Subcommittee on Long Term Issues supports goals to improve cardiovascular health statewide.

Reduction of Death Rates

The *Maryland Health Improvement Plan* includes objectives for heart disease and stroke that are intended to improve the cardiovascular health of residents of Maryland. The Healthy

Maryland Project 2010 includes the objective to reduce diseases of the heart deaths to no more than 100 per 100,000 population by 2010 (Baseline: 127.5 in 1997; Age-adjusted to 1940).

The Subcommittee on Long Term Issues recommends that Maryland set an additional target, relative to other states, to monitor its progress toward reducing deaths from coronary heart disease. Given Maryland's standing among other states with regard to socioeconomic measures, Maryland should establish a goal to improve its ranking among states in the nation for low age-adjusted death rates for total cardiovascular disease and for coronary heart disease by 2015.

Risk Factor Awareness

Healthy People 2010 identifies clinical preventive care as having a major positive impact on reducing many of the leading causes of disease and death. The Subcommittee on Long Term Issues has selected primary and secondary preventive care strategies to achieve the 2010 goal of improving the cardiovascular health of residents of Maryland. The Subcommittee on Long Term Issues believes that ensuring that best practices reach all communities will help to reduce disparities in cardiovascular health. The subcommittee supports using an approach that addresses the whole population or community as well as the individual patient.

In developing its recommendations, the subcommittee decided to focus on high blood pressure and congestive heart failure. Increasing awareness of the importance of controlling high blood pressure will help to reduce the risk for both heart disease and stroke. The Subcommittee on Long Term Issues believes that heart failure is costly, and leads to poor quality of life and poor survival and, therefore, recommends research efforts to improve the delivery of proved therapy to patients with this disease. The subcommittee's recommendation regarding a collaborative research project on chronic heart failure will promote improvements in the management of care for persons with heart failure.

HEALTH SYSTEM ORGANIZATION

The Subcommittee on Long Term Issues recommends that, to reduce illness, disabilities, and deaths caused by heart disease, Maryland should develop an approach to collaborative improvement designed to spread the adoption of evidence-based systems of care. Promoting the use of evidence-based guidelines is one strategy to reduce disparities in cardiovascular health care.

Automated External Defibrillators

Sudden cardiac death (SCD) is the most common fatal manifestation of heart disease, and in many cases it is the individual's first and only symptom. Reducing the proportion of out-of-hospital SCDs would decrease the overall incidence of premature death. Prompt use of automated external defibrillators (AEDs) to treat ventricular fibrillation has been shown to be critical in improving survival following cardiac arrest. The Subcommittee on Long Term Issues believes that it is important to address the issues of placement of AEDs within the state. By increasing the number of AEDs in communities and the number of people in those communities who are trained to use AEDs, outcomes for individuals in sudden cardiac arrest will improve.

FUTURE RESEARCH AGENDA

The Subcommittee on Long Term Issues identified several areas of future research: designing strategies to reduce disparities in outcomes when the knowledge generated in research studies is put into actual practice for the individual and community; improving delivery of care for people with chronic cardiovascular disease; and developing measures to assess quality within a system in which knowledge about performance improvement is connected to knowledge about improved results.

The subcommittee supports improvements in knowledge and research about women's cardiovascular health and treatment. Future research should also assess whether optimal use of proved therapies is implemented among racial minorities.

The Subcommittee on Long Term Issues believes that the measures that are used as benchmarks or indicators of the quality of cardiovascular care should be supported by sound scientific evidence and modified to reflect current research. The subcommittee supports quality measurement because it will encourage quality improvement.

Congestive Heart Failure

The magnitude of the problem of heart failure is expected to grow in the future because more cardiac patients are now able to survive heart attacks and other heart problems and live longer with their disease, thus increasing the potential for developing heart failure, and because future growth in the elderly population will likely increase the numbers of persons with heart failure. The Subcommittee on Long Term Issues supports the concept of a patient outcomes trial in this area.

I. INTRODUCTION

Background

One of the key issues in anticipating the future requirements of a system of specialized cardiac care services is to assess the likely impact of trends that will shape the future health care environment. Those trends include the potential impact of advances in the diagnosis, management, and treatment of clinical and sub-clinical heart disease.

Although many of the risk factors for coronary heart disease, including gender, age, and family history, cannot be altered, there is considerable evidence associating certain lifestyle factors with an increased risk of developing heart disease and persuasive clinical trial results establishing that reduction of risk factor levels by means of lifestyle modification and medication will reduce mortality and morbidity. Factors strongly implicated in heart disease include cigarette smoking, hypertension, diabetes, and hypercholesterolemia. Other risk factors include physical inactivity, diet, and obesity.[1] While a variety of factors have contributed to the declines experienced in heart disease mortality rates, the increased emphasis on and recognition of the importance of healthier lifestyles have clearly played an important role. Despite this encouraging trend, it is likely that heart disease will remain a leading cause of death and disability. Heart disease is one of the priorities listed in the state's Health Improvement Plan for 2010, a consensus document published by the Department of Health and Mental Hygiene. Those priorities are linked to the focus areas in the National Healthy People 2010 report.

Over the next decade, the baby boom generation will contribute to substantial increases in the older population most at risk for developing heart disease. While awareness of the importance of healthier lifestyles can be expected to moderate future utilization increases, for some patients the impact of minimizing adverse risk factors will be to delay the onset rather than prevent the development of heart disease. In addition, more people are surviving heart attacks. Reduced mortality from heart attacks has resulted in an increased incidence of congestive heart failure in the older patient population.[2, 3]

Composition of the Subcommittee

The Subcommittee on Long Term Issues is comprised of 17 members with expertise in cardiology, emergency medical services, public health, nursing, health education, and cardiac rehabilitation. A membership roster for the Subcommittee on Long Term Issues is provided in Figure 1. Steering Committee member Eugene Passamani, M.D., chairs the Subcommittee on Long Term Issues. Dr. Passamani is Senior Vice President, Medical Affairs and Director for Cardiology at Suburban Hospital in Bethesda, Maryland.

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[1] U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung, and Blood Institute, *Report of the Task Force on Behavioral Research in Cardiovascular, Lung, and Blood Health and Disease*, February 1998, page 30.

[2] Grady, D. As Heart Attacks Wane, Heart Failure is on the Rise. *The New York Times*, May 4, 1999, page D1.

[3] U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Changes in mortality from heart failure – United States, 1980 – 1995. *MMWR Morbidity and Mortality Weekly Report*. 1998; 47:633-7.

Purpose of the Subcommittee

The purpose of the Subcommittee on Long Term Issues was to identify topics for additional study and develop proposals to further evaluate key policy issues. The feasibility of developing programs that address other issues in cardiovascular health and disease, including racial and ethnic disparities in cardiac services, primary and secondary prevention (including treatment of patients with diabetes and/or hypertension), risk factor detection and treatment, early identification and treatment of heart attacks, and treatment of patients after ischemic events, was also considered by the Subcommittee on Long Term Issues. Specifically, the subcommittee considered the following issues:

- What progress has been made in Maryland toward the Healthy People 2010 objectives for heart disease deaths and risk factors?
- What steps can be taken to improve the management of care for congestive heart failure?
- What strategies should be developed to reduce racial and ethnic disparities in cardiac care services?
- Should Maryland develop mechanisms to evaluate the adequacy of detection, prevention, and treatment of cardiovascular disease in the state? What elements should be addressed?
- What are the priorities for future research on the prevention and treatment of heart disease in Maryland? What grant funds are potentially available to support the research agenda? Who should lead efforts to obtain grant funds?

The Subcommittee on Long Term Issues held a total of six meetings from June 2002 to January 2003. Meetings of the subcommittee were announced and open to the public. At its first meeting on June 5, 2002, the subcommittee members discussed the charge, structure, and timetable. The subcommittee had presentations from Jeanette Jenkins, MHS, regarding Healthy Maryland Project 2010; Edward Kasper, M.D., regarding heart failure; and Thomas Aversano, M.D., regarding a patient outcomes clinical trial on heart failure. The second meeting was held on July 25, 2002. The subcommittee discussed potential focus areas and developed a cardiovascular disease model. On October 17, 2002, the subcommittee had a presentation from Diane Bild, M.D., regarding the detection of subclinical coronary artery disease. At the November 20, 2002 meeting, the subcommittee discussed its preliminary recommendations. On December 12, 2002, the subcommittee had a presentation from Diane Becker, ScD, regarding partnerships in health research in African American communities. The subcommittee also continued the discussion of its recommendations. The final subcommittee meeting was held on January 22, 2003. At that meeting, the subcommittee had a presentation from Thomas Nolan, Ph.D., regarding process improvement.

Report Organization

Following this Introduction, the report provides an overview and background information on the Advisory Committee on Outcome Assessment in Cardiovascular Care. Section III of the report provides an overview of heart disease in Maryland. Section IV contains the findings and recommendations of the Subcommittee on Long Term Issues. The Appendices to the Report of the Long Term Issues Subcommittee include summary minutes of the six subcommittee meetings and detailed data tables.

Figure 1
**Advisory Committee on Outcome Assessment in Cardiovascular Care
Long Term Issues Subcommittee**

Chairman

Eugene R. Passamani, M.D.
Senior Vice President, Medical Affairs and
Director of Cardiology
Suburban Hospital
Bethesda, Maryland

Members

Jerilyn Allen, Ph.D.
The Johns Hopkins University School of Nursing
Baltimore, Maryland

Jane R. Apson, M.S.P.H., Ph.D.
Director of Quality Information Systems
Worcester County Health Department
Snow Hill, Maryland

Irene Buadoo, M.D.
Director, Cancer and Tobacco Programs
Montgomery County Department of
  Health and Human Services
Rockville, Maryland

Patricia Casals, R.N.
Clinical Nurse Manager, Interventional
Cardiology
Peninsula Regional Medical Center
Salisbury, Maryland

Donald H. Dembo, M.D.
President, Maryland Chapter of the American
College of Cardiology
Johns Hopkins Cardiology at Timonium
Timonium, Maryland

Sheila Druck, R.N., BSN
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Stacey Fisher, M.D.
Medical Director, Women's Heart Program
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Jeanette Jenkins
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Mark D. Kelemen, M.D.
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Aaron Kenigsberg, M.D.
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Silver Spring, Maryland

Ruth Maiorana
Director, Health Education and Planning
Harford County Health Department
Bel Air, Maryland

George Moran, M.D.
Chief, Cardiology
Union Memorial Hospital
Baltimore, Maryland

Lisa Myers, R.N., M.S.
Director, Program Development
MIEMSS
Baltimore, Maryland

Kenneth Rempher, RN
Advanced Practice Nurse
Sinai Hospital of Baltimore
Baltimore, Maryland

John M. Ryan, M.D.
Director, Office of Chronic Disease
Department of Health and Mental Hygiene
Baltimore, Maryland

Cheryl VanKuren
Program Manager, Cardiac Rehabilitation
Union Memorial Hospital
Baltimore, Maryland

II. ADVISORY COMMITTEE ON OUTCOME ASSESSMENT IN CARDIOVASCULAR CARE

Purpose of the Advisory Committee

The MHCC took actions to update the Maryland State Health Plan chapter, COMAR 10.24.17, governing cardiac surgery and therapeutic catheterization services in 2000 and 2001. In preparing that plan, the Commission recognized the need to establish an Advisory Committee on Outcome Assessment in Cardiovascular Care to promote the development of a Maryland model for continuous quality improvement.

The purpose of the Advisory Committee on Outcome Assessment in Cardiovascular Care is to study and develop recommendations to the Commission on establishing an ongoing, statewide quality improvement program in cardiovascular care. The goals of this effort are to identify baseline indicators to measure current performance, design an approach for continuous quality improvement, and evaluate options for funding a statewide quality improvement effort. In addition to targeting performance improvement for care currently provided, the Commission is interested in better understanding how the organization of cardiac services impacts quality of care and access considerations. Key tasks involved in this project are outlined below:

- Identify quality measures and risk adjustment methods and develop recommendations on the structure and content of a Maryland Cardiovascular Care Data Reporting System designed to support outcome assessment;
- Study available models for quality improvement in cardiovascular care, focusing initially on cardiac surgery and coronary angioplasty services, and develop recommendations on the appropriate governance, organizational structure, staffing, and funding for an ongoing outcome assessment process for cardiovascular care in Maryland;
- Develop a research agenda to advance the understanding of how cardiac care services should be organized to improve outcomes, including, but not limited to, developing an evidence-based approach to reviewing policies governing the location of primary and elective angioplasty services; and
- Identify strategies for developing a statewide inter-hospital transport system for specialized cardiac care services and recommend actions that public and private sector organizations should take to implement an inter-hospital transport system.

Organizational Structure

In early 2002, the Commission took steps to organize and appoint the Advisory Committee on Outcome Assessment in Cardiovascular Care. In order to get broad participation in the process, and to focus available expertise in specific areas, the Commission structured the Advisory Committee to include a Steering Committee and four subcommittees (refer to Figure 2). Steering Committee members were appointed by Donald E. Wilson, M.D., MACP, Chairman of the Maryland Health Care Commission, after considering nominations received from a wide range of organizations, including hospitals, state and national professional associations, state government, and health care policy research organizations. The Steering Committee is chaired by James Scheuer, M.D., Professor of Medicine and University Chairman Emeritus at the Albert

Einstein College of Medicine/Montefiore Medical Center in New York. Each subcommittee includes members from the Steering Committee as well as other interested individuals. Members of the Steering Committee have been appointed to chair each subcommittee. Recommendations developed by each subcommittee are submitted to the Steering Committee and the Steering Committee reports directly to the Commission. The Commission sought participants from a wide range of organizations, including the Maryland Department of Health and Mental Hygiene (DHMH), the Maryland Institute for Emergency Medical Services Systems (MIEMSS), Maryland acute care hospitals, and state and national professional associations, in appointing subcommittee members. The four subcommittees established to assist the Steering Committee are:

- *Subcommittee on Quality Measurement and Data Reporting*

This subcommittee studied available models for quality improvement in cardiovascular care and developed recommendations to the Steering Committee on the approach that should be used in Maryland.

- *Subcommittee on Interventional Cardiology*

This subcommittee conducted a detailed review of the results of the Atlantic Cardiovascular Patient Outcomes Research Team (C-PORT) project and developed recommendations on the types of hospitals that should perform primary angioplasty. In addition, the subcommittee reviewed the policy of providing elective angioplasty services only in hospitals with on-site cardiac surgical services and the recommended minimum utilization standard for elective angioplasty.

- *Subcommittee on Inter-Hospital Transport*

The Subcommittee on Inter-Hospital Transport studied strategies for improving the transport of cardiac patients between hospitals. The subcommittee identified potential strategies for developing a statewide approach to the inter-hospital transport system for specialized cardiac care services and recommended actions that public and private sector organizations should take to strengthen the inter-hospital transport system.

- *Subcommittee on Long Term Issues*

The focus of this subcommittee was on identifying topics for further study, developing proposals to further evaluate key policy issues, and developing a long-range, evidence-based approach for assessing the impact of changes in cardiovascular services. This subcommittee considered the feasibility and advisability of developing programs that address other issues in cardiovascular health and disease, such as screening, primary and secondary prevention, congestive heart failure, hypertension, and diabetes care.

Maryland Health Care Commission

Advisory Committee on Outcome Assessment in Cardiovascular Care

Steering Committee

Quality Measurement and Data Reporting Subcommittee

•Study available models for quality improvement in cardiovascular care and recommend an approach that should be used in Maryland

•Identify quality measures and risk adjustment methods and develop recommendations on the structure and content of a Maryland Cardiovascular Care Data Reporting System

Interventional Cardiology Subcommittee

•Review state health planning policies governing primary and elective angioplasty in hospitals without on-site cardiac surgery

•Assess the feasibility of a pilot project to study outcomes of elective angioplasty in hospitals without on-site cardiac surgery

Inter-Hospital Transport Subcommittee

•Identify strategies for developing a statewide transport system for specialized cardiac care services

•Recommend actions that public and private sector organizations should take to implement an inter-hospital transport system

Long Term Issues Subcommittee

•Identify topics for further study, including prevention and treatment of heart disease, early identification and treatment of heart attacks, improving quality of care for patients with heart failure, and racial and gender disparities in access to care

•Develop proposals to further evaluate key policy issues

III. OVERVIEW: HEART DISEASE IN MARYLAND

TRENDS IN CARDIOVASCULAR DISEASE MORTALITY

Cardiovascular diseases[4] (principally, coronary heart disease and stroke) are the nation's most common cause of death. Heart disease and stroke are the number one and number three causes of death, respectively, in both Maryland and the United States. (see Figure 3). In 2000, heart disease was also the third leading chronic condition causing activity limitation.[5] Hypertension and stroke were also common causes of activity limitation.

Figure 3
Leading Causes of Death,
Maryland Compared with the United States, 2001.
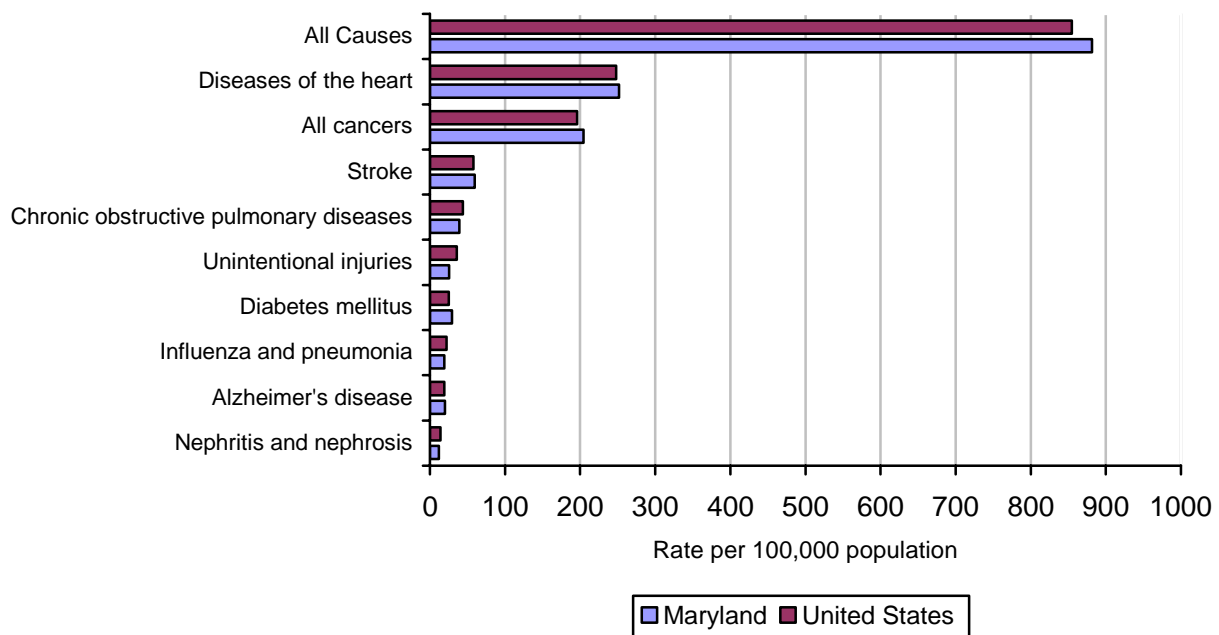
Source: Arias E, Anderson RN, Hsiang-Ching K, Murphy SL, Kochanek KD. *Deaths: Final data for 2001*. National vital statistics reports; vol 52 no 3. Hyattsville, Maryland: National Center for Health Statistics. 2003.
Deaths per 100,000, age-adjusted to 2000 total US population. ICD-10-CM codes.
See Appendix B for detailed data, Table B-1.

Published data on death rates for the nation and state are available from a number of sources. Data reported by the American Heart Association in *Heart Disease and Stroke Statistics-2004 Update* indicate that, based on 2000 age-adjusted death rates per 100,000 population (including District of Columbia and Puerto Rico), Maryland ranked 32nd for total

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[4] Cardiovascular disease commonly refers to the "diseases of the heart" (including acute rheumatic fever and chronic rheumatic heart diseases, hypertensive heart disease, coronary heart disease, pulmonary heart disease, and congestive heart failure), cerebrovascular diseases (including stroke), and atherosclerosis.
[5] National Institutes of Health, National Heart, Lung, and Blood Institute, *Morbidity and Mortality: 2002 Chart Book on Cardiovascular, Lung, and Blood Diseases*, May 2002, p. 7.

cardiovascular disease, 30th for coronary heart disease, and 32nd for stroke.[6] As Table 1 shows, Maryland's death rates in 1999 were below the nation's rates, with the exception of the rates for stroke.

Table 1
1999 Age-Adjusted Death Rates for Maryland and the United States.

	Maryland	USA
Total Cardiovascular Disease	344.8	352.4
Coronary Heart Disease	191.9	195.6
Stroke	63.1	61.8

Source: NCHS compressed mortality file for years 1996 to 1999. Rates are age-adjusted per 100,000 population using the 2000 U.S. standard as the base.

During the period 1992-2001, heart disease mortality rates in Maryland declined 15 percent (see Figure 4).[7] However, the United States, as a whole, reduced its mortality due to diseases of the heart by 18 percent over the same time period. In 2001, 12,217 Marylanders died of diseases of the heart.[8]

Figure 4
Age-Adjusted Death Rates per 100,000 Population for Diseases of the Heart: Maryland and the U.S., 1992-2001.
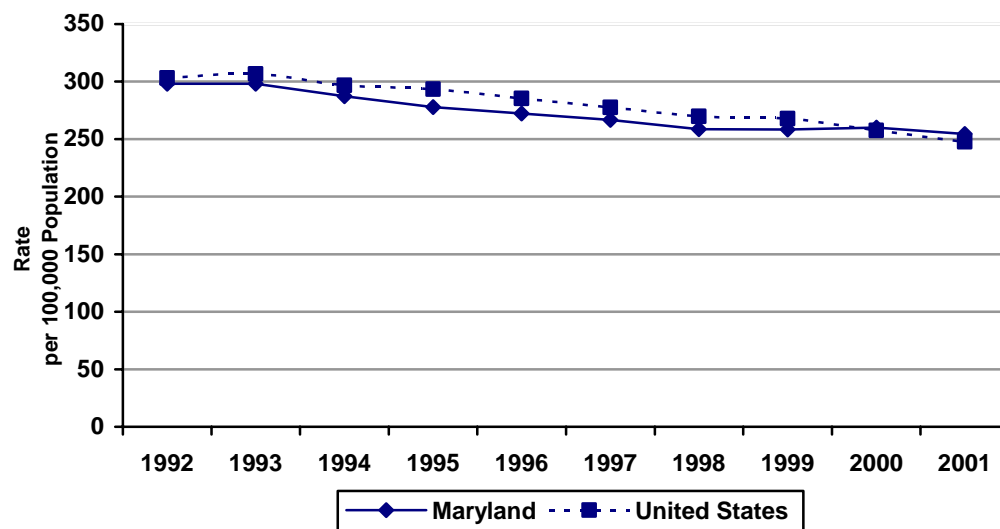
Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001*. (Age-adjusted to the projected 2000 U.S. population. ICD-10-CM codes.) See Appendix B for detailed data, Table B-2a.

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[6] American Heart Association. *Heart Disease and Stroke Statistics – 2004 Update*. Dallas, Tex.: American Heart Association, 2003.

[7] Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001*.

[8] Centers for Disease Control and Prevention: Chronic Diseases, Risk Factors, and Preventive Services, Maryland, 2002. http://apps.nccd.cdc.gov/BurdenBook/DeathCause.asp?state=md; accessed July 28, 2003.

Among 728,743 cardiac disease deaths that occurred in the U.S. during 1999, a total of 462,340 (63.4 percent) were SCDs; 120,244 (16.5 percent) occurred in an ED or were dead on arrival, and 341,780 (46.9 percent) occurred out-of-hospital (in a nursing home, residence, or unspecified place outside of a hospital). In 1999, the state-specific proportion of all cardiac deaths classified as SCD ranged from 57.2 percent (Hawaii) to 72.9 percent (Wisconsin); 69.2 percent of all cardiac deaths in Maryland were SCDs (see Table B-3).[9]

Healthy People 2010 is a national initiative to promote health and prevent disease. Healthy People 2010 identifies individual behaviors, physical and social environmental factors, and health system issues that affect the health of individuals and communities. Together with community support, health care providers and systems are critical factors in achieving long-term control of cardiovascular risk factors and reducing mortality.

Healthy People 2010 is a statement of national health objectives designed to identify the most significant preventable threats to health and to establish national goals to reduce those threats. These objectives are developed by a collaborative process and are designed to measure progress over time. In previous Healthy People projects the goals had been to reduce or control health problems. Under the 2010 project, the primary goal is to eliminate health disparities and increase quality and years of healthy life.[10]

The plan contains 467 objectives that are organized into 28 focus areas. There are 16 objectives regarding heart disease and stroke specifically, and more in related areas that are relevant to heart disease and stroke. One of the plan's goals is to improve cardiovascular health and quality of life through:

- prevention, detection, and treatment of risk factors;
- early identification and treatment of heart attacks and strokes; and
- prevention of recurrent cardiovascular events.

Healthy Maryland Project 2010 is the statewide public health initiative that is laying the groundwork to meet the public health needs of Marylanders during the first decade of this new millennium. Linked to the national Healthy People 2010 focus areas and objectives, Healthy Maryland Project 2010 identifies statewide health priorities, aims to foster public and private partnerships, and develops a Health Improvement Plan (HIP) for the State of Maryland. The HIP provides an array of information and 'actionable' health improvement strategies for 17 priority focus areas, including heart disease and stroke. The Plan also contains local objectives and action steps for each of Maryland's 24 jurisdictions. Each local jurisdiction selected its focus areas through a data- gathering process involving community coalitions.

The elimination of health disparities among different segments of the population is a goal of the national Healthy People initiative. Those segments include race, ethnicity, gender, age, socioeconomic status (SES), and geographic location. Healthy People 2010 uses a standard data

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[9] Centers for Disease Control and Prevention. State-specific mortality from sudden cardiac death--United States, 1999. *MMWR Morb Mortal Wkly Rep*. 2002 Feb 15;51(6):123-6.

[10] Jenkins, J., "Healthy Maryland Project 2010 – Options for Cardiovascular Disease Assessment/Target Setting" (presented at the meeting of the Subcommittee on Long Term Issues, Baltimore, Maryland, June 5, 2002).

table to display the baseline status of population groups for which objectives have been established and for which data are available. The minimum set includes race and ethnicity, gender, and SES measures (e.g., education and family income) (see Table 2).

Table 2
Coronary Heart Disease Deaths, United States

Total Population, 1998	Coronary Heart Disease Deaths Rate per 100,000
TOTAL	208
Race and ethnicity	
American Indian or Alaska Native	126
Asian or Pacific Islander	123
Black or African American	252
White	206
Hispanic or Latino	145
Not Hispanic or Latino	211
Black or African American	257
White	208
Gender	
Female	165
Male	265
Education level (aged 25 to 64 years)	
Less than high school	96
High school graduate	80
At least some college	38

Note: Age-adjusted to the year 2000 standard population.
Source: http://www.cdc.gov/cvh/hp2010/objectives.htm#heart%20disease; accessed July 28, 2003.

Data from the *Maryland Vital Statistics Annual Report 2001* confirm that heart disease deaths among Maryland adults are higher for men; higher for African-American men than for Caucasian men; and higher for African-American women than for Caucasian women (see Figure 5).[11]

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[11] Maryland Department of Health and Mental Hygiene, Vital Statistics Administration. *Maryland Vital Statistics Annual Report, 2001*.

Figure 5
Age-Adjusted Death Rates per 100,000 Population for Diseases of the Heart by Race and Sex: Maryland, 1992-2001.
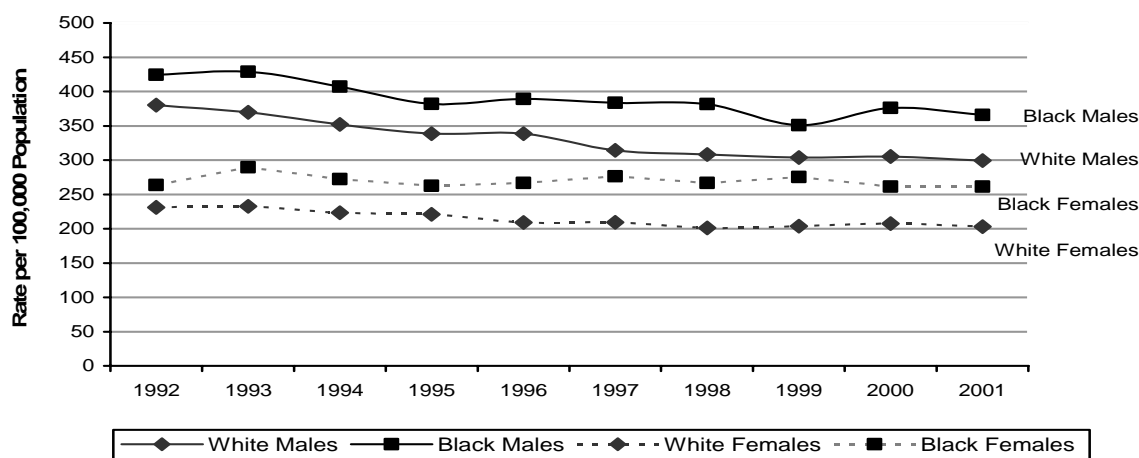
Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001*. (Age-adjusted to the projected 2000 U.S. population.) Refer to Appendix B for detailed data, Table B-2b.

Figures 6 through 9 show Maryland's rank among states and relative to the national average with regard to the following measures: household income, poverty, health insurance coverage, and deaths caused by diseases of the heart.

Maryland's three-year (1999-2001) average median household income of $50,013 is the second highest in the nation, placing the state 28 percent above the national average (see Figure 6). Maryland residents experienced the third lowest percent of persons in poverty in the nation, with only 7.3 percent of the population living below the poverty level, compared to 11.6 percent for the United States as a whole (see Figure 7). Despite these positive socioeconomic markers, Maryland ranked 21st among states in the percentage of the population who did not have health insurance coverage; 11.3 percent of Marylanders did not have health insurance coverage, compared to 14.5 percent for the United States as a whole (see Figure 8).[12] Additionally, Maryland ranked 32nd in the rate of mortality due to heart disease in 2001 with a rate of 251.6 per 100,000, compared to the national rate of 247.8 (see Figure 9).

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[12] An analysis of health insurance coverage prepared by the Commission indicates that Maryland experienced an increase in its two-year-average uninsured rate during 2000-2002, from 11.3 to 12.8 percent for all residents, and from 12.8 to 14.4 percent among the non-elderly population.
http://www.mhcc.state.md.us/health_care_expenditure/insurance_report_1103.pdf

Figure 6: Income of Household by State Using Three-Year Average Median: 1999-2001.
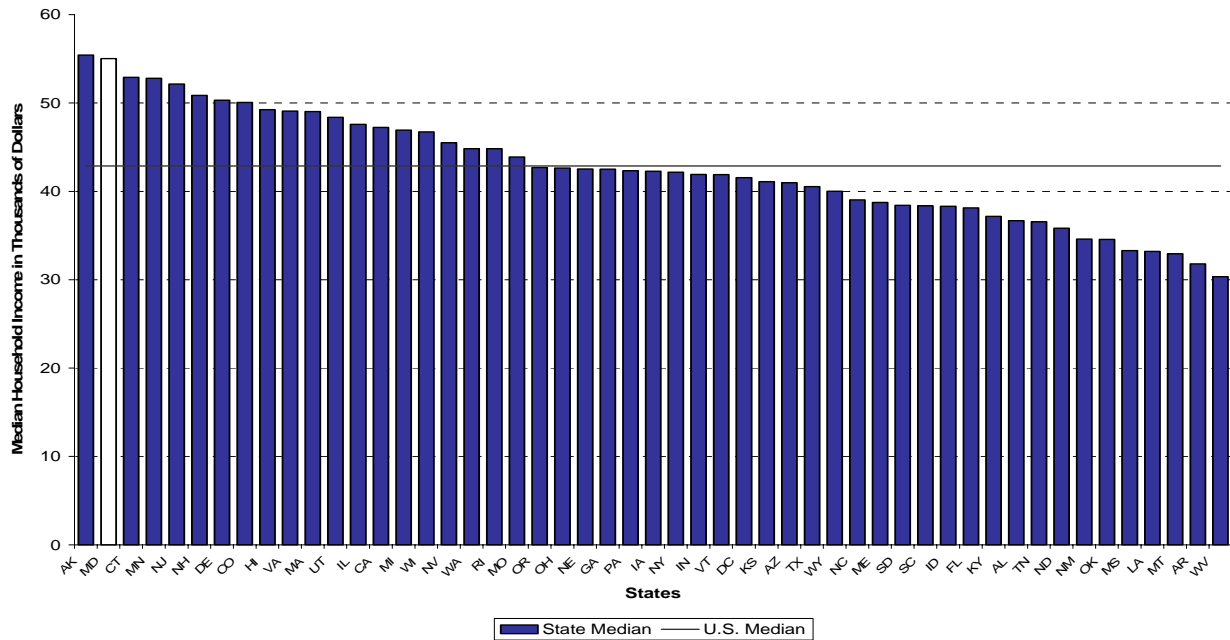
Source: DeNavas-Walt, Carmen and Robert Cleveland, U.S. Census Bureau, Current Population Reports, P60-218, *Money Income in the United States: 2001*, U.S. Government Printing Office, Washington, DC, 2002. (http://www.census.gov/prod/2002pubs/p60-218.pdf)

Figure 7: Percent of Persons in Poverty by State Using Three-Year Average: 1999-2001.
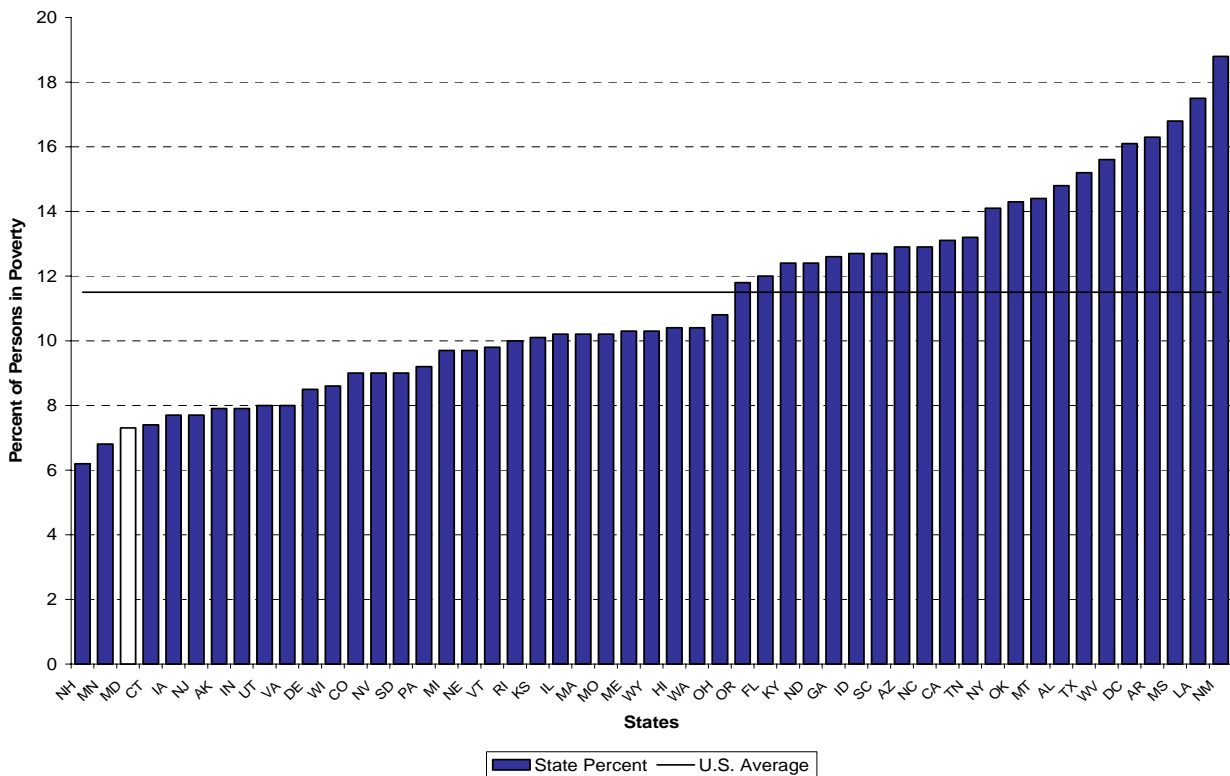
Source: Proctor, Bernadette D. and Joseph Dalaker, U.S. Census Bureau, Current Population Reports, P60-219, *Poverty in the United States: 2001*, U.S. Government Printing Office, Washington, DC, 2002. (http://www.census.gov/prod/2002pubs/p60-219.pdf)

Figure 8: Percent of People without Health Insurance Coverage for the Entire Year by State (3-Year Average): 1999-2001.
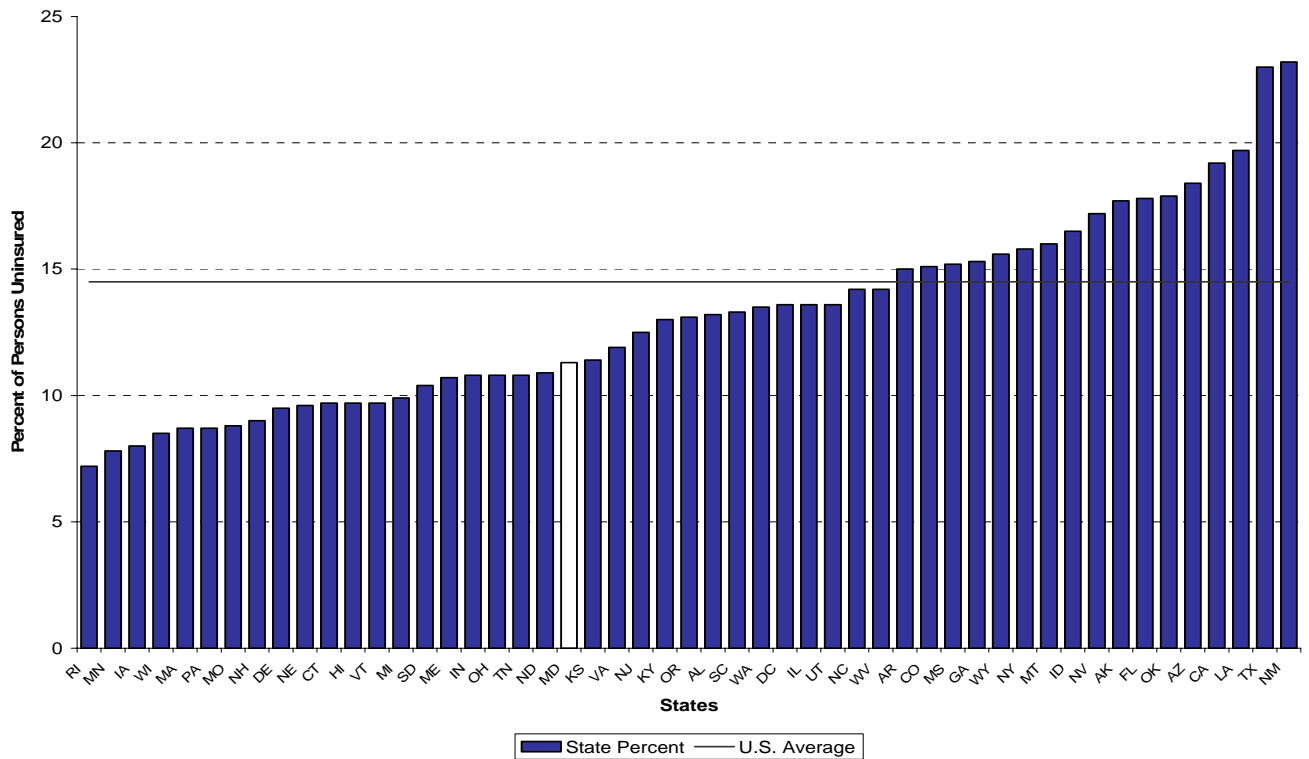
Source: Mills, Robert J., U.S. Census Bureau, Current Population Reports, P60-220, *Health Insurance Coverage: 2001*, U.S. Government Printing Office, Washington, DC, 2002. (http://www.census.gov/prod/2002pubs/p60-220.pdf)

Figure 9: Diseases of the Heart Mortality Rate by State: 2001.
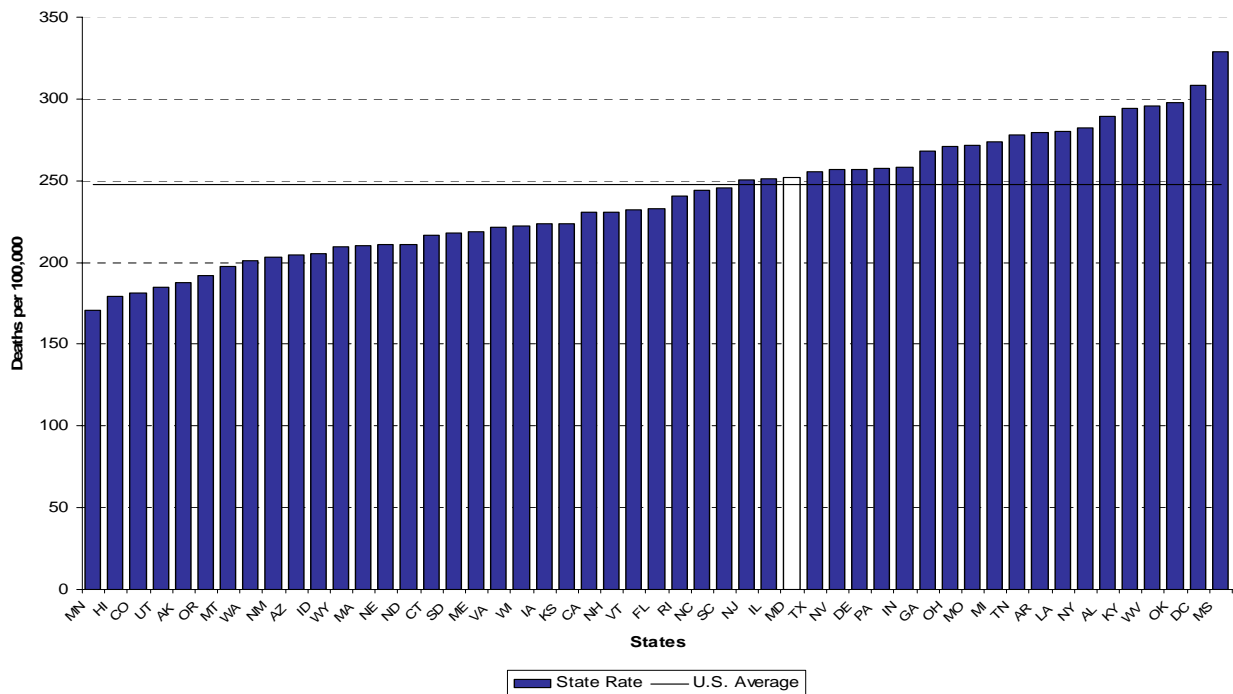
Source: Arias E, Anderson RN, Hsiang-Ching K, Murphy SL, Kochanek KD. *Deaths: Final data for 2001*. National vital statistics reports; vol 52 no 3. Hyattsville, Maryland: National Center for Health Statistics. 2003. (http://www.cdc.gov/nchs/data/nvsr52/nvsr52_03.pdf)

Refer to Appendix B for detailed data, Tables B-4 and B-5.

CARDIOVASCULAR DISEASE RISK FACTORS

The American Heart Association has identified several risk factors that contribute to heart disease mortality. Heart disease risk factors are divided into two main categories -- modifiable and non-modifiable. Modifiable risk factors include those behaviors or conditions that can be changed, treated, or modified. Non-modifiable risk factors include those factors that are unable to be changed, treated, or modified.

Modifiable Risk Factors

Lifestyle modifications to change risk factors are a major strategy for preventing heart disease and stroke in the population. Heart disease and stroke risk factors that can be controlled include:

- Tobacco use
- High blood pressure (hypertension)
- Abnormal cholesterol
- Overweight and obesity
- Diabetes
- Physical inactivity

A high proportion of people with coronary heart disease have one or more risk factors. The American Heart Association notes that cigarette smoking increases blood pressure, decreases exercise tolerance, increases LDL (bad) cholesterol, decreases HDL (good) cholesterol, and increases the tendency for blood to clot.

Hypertension

The Joint National Committee 7 (JNC-7) has noted that the relationship between blood pressure and risk of cardiovascular disease events is continuous, consistent, and independent of other risk factors.[13] According to the Behavioral Risk Factor Surveillance System (BRFSS)[14], hypertension is a growing problem in Maryland. The prevalence of high blood pressure has steadily increased from about 21 percent of the population in 1995 to 26 percent in 2001 (Table 3). To determine the prevalence of high blood pressure, BRFSS respondents were asked, "Have you ever been told by a doctor, nurse, or other health professional that you have high blood pressure?"

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[13] Chobanian, AV et al. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. *Hypertension*. 2003; 42:1206-1252.

[14] The BRFSS is a cross-sectional telephone health survey. With assistance from the Centers for Disease Control and Prevention (CDC), all 50 states, the District of Columbia, and Puerto Rico participate in the system. The Virgin Islands and Guam participate by conducting point-in-time surveys. People aged 18 and older are called randomly and asked to take part in the survey. The survey consists primarily of questions about personal behaviors that increase the risk for one or more of the 10 leading causes of death in the United States. Nationwide, survey items remain relatively constant from year to year. All states ask fixed core questions every year, and rotating core questions every other year. Based on their needs, states can select standardized questions from optional modules. Additionally, states can add their own questions to track particular health concerns. The 2001 BRFSS included, among others, questions on health status, health care access, exercise, and hypertension awareness.

Table 3
Diagnosed with High Blood Pressure in Maryland and United States: 1995-2001.

	Maryland %	USA Median %
1995	20.8	22.2
1997	23.8	23.0
1999	24.5	23.9
2001	26.3	25.6

Source: CDC, Behavioral Risk Factor Surveillance System, http://apps.nccd.cdc.gov/brfss/index.asp.
Maryland percentage; United States median percent of States surveyed.

Data from the BRFSS show that Marylanders are routinely having blood pressure checks. BRFSS respondents were asked, "About how long has it been since you last had your blood pressure taken by a health professional?" In 1999, only 3.4 percent of Marylanders reported that they had not had their blood pressure checked within 2 years (Table 4).

Table 4
No Blood Pressure Check within 2 Years: Maryland and United States: 1995-1999.

	Maryland %	USA Median %
1995	4.8	6.1
1997	3.6	5.7
1999	3.4	5.2

Source: CDC, Behavioral Risk Factor Surveillance System, http://apps.nccd.cdc.gov/brfss/index.asp.
Maryland percentage; United States median percent of States surveyed.

Overweight and obesity

Trends for obesity and overweight clearly show that Maryland residents are growing heavier (see Figure 10). This increase parallels and perhaps, in part, is a cause of the increase in high blood pressure.

Figure 10
Obesity by Body Mass Index in Maryland and United States: 1990-2001.
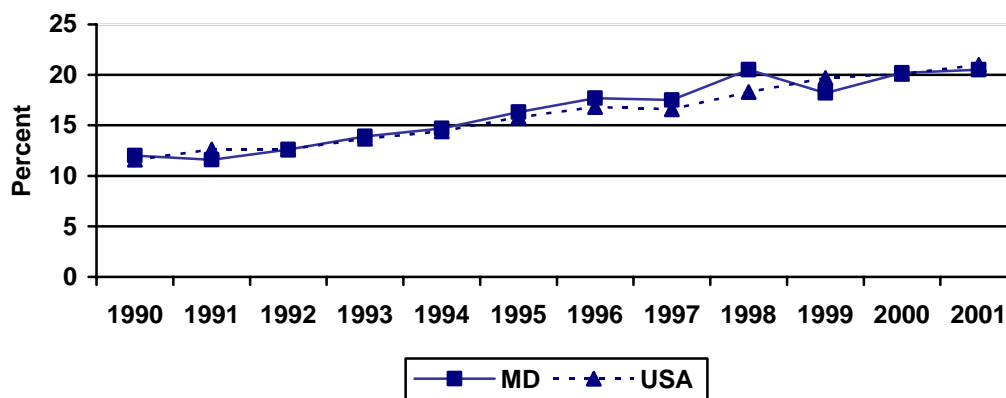
Source: CDC, Behavioral Risk Factor Surveillance System, 2003.
Maryland percentage obese; United States median percent of States surveyed.
Refer to Appendix B for detailed data, Table B-6.

Obesity is defined as a body mass index (BMI) of 30 or greater, while overweight is defined as a BMI between 25 and 30. BMI is the ratio of an individual's weight (in kilograms) to height (in meters squared). Obesity and overweight have become increasingly prevalent among adults since the 1980s. Results from the 1999-2000 National Health and Nutrition Examination Survey (NHANES) indicate that an estimated 64 percent of adults (age 20 years and over) nationwide were either overweight or obese.[15] NHANES uses measured heights and weights.

Data from the 2001 BRFSS indicate that the prevalence of obesity in adults continued to increase in both sexes, all ages, all races, and all educational levels.[16] Maryland residents ranked 20th in the proportion of people who were obese; 19.8 percent of the Maryland population was obese, with the United States population as a whole having an obesity rate of 20.9 percent, with a range of 14.4 (Colorado) to 25.9 (Mississippi) percent (see Table B-7).

BRFSS requires self-reported weight and height, which were assessed by asking, "About how much do you weigh without shoes?" and "About how tall are you without shoes?" Data on self-reported weight and height are used to calculate body mass index. The rate of obesity identified by BRFSS is likely to be underestimated. Individuals without telephones are not included in BRFSS, and such persons are likely to be of low socioeconomic status, a factor associated with obesity. In addition, validation studies of self-reported weight and height indicate that overweight participants tend to underestimate their weight, and all participants tend to overestimate their height.

In January 1991, the National Heart, Lung, and Blood Institute of the National Institutes of Health launched the Obesity Education Initiative. The overall purpose of the initiative is to help reduce the prevalence of overweight persons along with the prevalence of physical inactivity in order to reduce the risk of coronary heart disease and overall morbidity and mortality from coronary heart disease. Healthy People 2010 reports that 23 percent of adults aged 20 and older were identified as obese in 1988-94 (age-adjusted to the year 2000 standard population). The national target Healthy People 2010 is aiming for is 15 percent.[17]

Experts believe that the rise in BMI is the result of an overall high-calorie diet and low levels of physical activity. This problem appears to be mainly due to advances in technology, which have resulted in higher standards of living but work that is more sedentary.[18] National

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[15] Centers for Disease Control and Prevention, National Center for Health Statistics. "Prevalence of Overweight and Obesity Among Adults: United States, 1999-2000." Available at: www.cdc.gov/nchs/products/pubs/pubd/hestats/obese/obse99.htm; accessed July 2003.

[16] Mokdad AH et al. Prevalence of Obesity, Diabetes, and Obesity-Related Health Risk Factors, 2001. *Journal of the American Medical Association*. January 1, 2003; 289(1):76-79.

[17] Healthy People 2010 Objectives: Reduce Proportion of Adults who are Obese. 2000. Available at: http://www.healthypeople.gov/document/html/objectives/19-02.htm.

[18] Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. "Preventing Obesity Among Children." *Chronic Disease Notes & Reports*. Winter 2000;13(1):1-4.

medical spending related to overweight and obesity may be as high as $93 billion a year (in 2002 dollars).[19]

Diabetes

Diabetes is another key concern as it seriously increases the risk of developing cardiovascular disease. Even when glucose levels are controlled, diabetes increases the risk of heart disease and stroke, but the risks are even greater if blood sugar levels are not well controlled.[20] Therefore, communicating the need to control blood sugar levels is important in preventing mortality from heart disease.

Diagnosed diabetes was assessed through the BRFSS by asking, "Have you ever been told by a doctor that you have diabetes?" The rate of diabetes identified by BRFSS is likely to be underestimated. As noted above, individuals without telephones are not included in BRFSS, and such persons are likely to be of low socioeconomic status, a factor also associated with diabetes. In addition, undiagnosed diabetes was not counted; recent estimates indicate that about 35 percent of all persons with diabetes have not been diagnosed.

The 2001 BRFSS data showed 8.1 percent of Maryland residents being diagnosed with diabetes, which ranked the State at 36th (see Table B-7); the national average was 7.9 percent (ranging from 5.0 percent for Minnesota, to 10.5 percent for Alabama).

Metabolic syndrome is an important cluster of coronary heart disease risk factors with insulin resistance. The National Cholesterol Education Program (NCEP) developed clinical diagnosis guidelines for metabolic syndrome to aid identification of individuals at risk for both coronary heart disease (CHD) and type 2 diabetes. The guidelines incorporate thresholds for 5 easily measured variables linked to insulin resistance: waist circumference, triglycerides, HDL cholesterol, fasting plasma glucose concentration, and blood pressure. According to the NCEP-defined metabolic syndrome, classification is triggered when predefined limits of any 3 of the above-mentioned 5 criteria are exceeded.[21] Data from the Third National Health and Nutrition Examination Survey (NHANES III), 1988-1994, showed that the metabolic syndrome was present in more than 20 percent of the U.S. adult population; varied substantially by ethnicity even after adjustment for body mass index, age, socioeconomic status, and other predictor variables; and was associated with several potentially modifiable lifestyle factors. Researchers concluded that the identification and clinical management of this high-risk group are important in the prevention of coronary heart disease.[22]

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[19] Finkelstein, EA et al. "National Medical Spending Attributable to Overweight and Obesity: How Much, and Who's Paying?" *Health Affairs*, May 14, 2003. Available at: http://www.healthaffairs.org/WebExclusives/Finkelstein_Web_Excl_051403.htm; accessed July 2003.
[20] American Heart Association. Risk Factors and Coronary Heart Disease. 2002. Available at: http://www.americanheart.org/presenter.jhtml?identifier=4726.
[21] Sattar, N et al. Metabolic Syndrome With and Without C-Reactive Protein as a Predictor of Coronary Heart Disease and Diabetes in the West of Scotland Coronary Prevention Study. *Circulation*. 2003 Jul 29;108(4):414-419.
[22] Park, Y-W et al. The Metabolic Syndrome: Prevalence and Associated Risk Factor Findings in the US Population From the Third National Health and Nutrition Examination Survey, 1988-1994. *Archives of Internal Medicine*. 2003 February 24;163:427-436.

<u>Non-Modifiable Risk Factors</u>
Risk factors that can not be changed include:

- Increasing age
- Family history
- Gender
- Heredity, including race

Advancing age is a major risk factor for cardiovascular disease. According to the National Heart, Lung, and Blood Institute (NHLBI), up to three-quarters of Americans over the age of 65 have either obvious or sub-clinical coronary heart disease (see Table B-9). NHLBI also notes that persons with a family history of early heart disease (having a mother or sister diagnosed with heart disease before age 65, or a father or brother diagnosed before age 55) are more likely to develop it themselves.

Males have a higher age-adjusted death rate from cardiovascular disease as compared to females; however, in terms of absolute numbers, there are more deaths annually among females than males. Of the 12,217 total Maryland deaths from diseases of the heart in 2001, females represented 6,341 as compared to 5,876 deaths for males. The greater number of deaths among women exists generally because they tend to live to older ages when cardiovascular disease is more common. Additionally, women generally experience poorer prognoses following a major heart event.[23] The male-female ratio in Maryland is 93.4, which is ranked 44th among all states. Alaska has the highest ratio of males to females (107.0), and the District of Columbia has the lowest male-female ratio (89.0) (see Table B-10).

Racial and ethnic disparities exist in heart disease among both men and women. It is well recognized that African-Americans have more severe high blood pressure than Caucasians and, thus, a higher risk of heart disease.[24] The African-American population accounted for 27.9 percent of the Maryland population in 2000, considerably higher than the national figure of 12.3 percent, with a range from 0.3 percent (Montana) to 60.0 percent (District of Columbia) (see Table B-11).

Additionally, the American Heart Association notes that, partly due to higher rates of obesity and diabetes, heart disease is also higher among Mexican Americans, American Indians, native Hawaiians, and some Asian Americans. (See Table B-12 for distribution of Hispanic population.)

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[23] Maryland Department of Health and Mental Hygiene, Division of Cardiovascular Health and Nutrition. *Maryland Cardiovascular Disease Surveillance – Statistics for Cardiovascular Disease.* 2001.

[24] American Heart Association. Risk Factors and Coronary Heart Disease. 2002. Available at: http://www.americanheart.org/presenter.jhtml?identifier=4726.

ACUTE CARE HOSPITALIZATION FOR CARDIOVASCULAR DISEASE

In-Hospital Care

Hospitalization is one component of a system of cardiovascular health care services. In 2001, there were an estimated 32.7 million inpatient discharges, excluding newborn infants, from non-federal short-stay hospitals in the United States. Data from the 2001 National Hospital Discharge Survey from the Centers for Disease Control and Prevention showed that the most frequent reason for hospitalization was heart disease, accounting for 4.3 million (13 percent) discharges. While the national rate of hospitalization for most conditions decreased over the past two decades, congestive heart failure increased by 62 percent for those 65 and over from 1980 (133.4 per 10,000 population) to 2001 (216.7 per 10,000 population); however, these rates have become more stable over recent years (see Table 5).[25]

Table 5
Rate of Hospitalization for Diseases of the Circulatory System, Heart Disease, and Congestive Heart Failure for Discharges Aged 65 Years and Over:
United States, 1997-2001

Category of first-listed diagnosis	Discharge rate per 10,000 population				
	1997	1998	1999	2000	2001
Diseases of the circulatory system	1,180.2	1,200.6	1,199.0	1,178.3	1,137.9
Heart disease	802.2	829.5	843.7	827.8	791.0
Congestive heart failure	223.2	226.7	221.1	222.4	216.7

Note: The population estimates used to compute rates for 2001 were based on the 2000 census, and the 2001 rates are not directly comparable to the 1997 to 2000 rates, which were computed using estimates based on the 1990 census. Discharges of inpatients from non-federal hospitals are reported by first-listed diagnosis.
Diagnoses presented are coded according to ICD–9–CM (Diseases of the circulatory system: 390-459; Heart disease: 391-392.0,393-398,402,404,410-416,420-429; Congestive heart failure: 428.0).
Source:
1997 - Kozak LJ, Lawrence L. National Hospital Discharge Survey: Annual summary, 1997. National Center for Health Statistics. *Vital Health Stat* 13(144). 1999.
1998 - Popovic JR, Kozak LJ. National Hospital Discharge Survey: Annual summary, 1998. National Center for Health Statistics. *Vital Health Stat* 13(148). 2000.
1999 - Popovic JR. 1999 National Hospital Discharge Survey: Annual Summary with detailed diagnosis and procedure data. National Center for Health Statistics. *Vital Health Stat* 13(151). 2001.
2000 - Kozak LJ, Hall MJ, Owings MF. National Hospital Discharge Survey: 2000 Annual Summary with detailed diagnosis and procedure data. National Center for Health Statistics. *Vital Health Stat* 13(153). 2002.
2001 - Hall MJ, DeFrances CJ. 2001 National Hospital Discharge Survey. *Advance data from vital and health statistics*; no 332. Hyattsville, Maryland: National Center for Health Statistics. 2003.

For Maryland residents 65 and older, the rate of hospitalization for congestive heart failure remained stable from 1997 (222.8 per 10,000 population) to 2001 (223.4 per 10,000 population). The rate declined 6 percent in 2002 (see Table B-8).

In 2002, there were 687,199 discharges from non-federal, acute care hospitals in Maryland. Cardiovascular diseases (ICD-9-CM codes 390-434, 436-448 reported as the

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[25] Hall MJ, DeFrances CJ. 2001 National Hospital Discharge Survey. Advance data from vital and health statistics; no 332. Hyattsville, Maryland: National Center for Health Statistics. 2003.

principal diagnosis) accounted for 99,394 discharges (14 percent). Those discharges accounted for 437,897 days (15 percent) in the hospital and $1 billion (20 percent) in hospital charges.

Table 6
Hospitalization Patterns for Cardiovascular Diseases in Maryland Hospitals: 2002

	Cardiovascular Diseases	Diseases of the Heart	Congestive Heart Failure	Stroke
ICD-9-CM	**390-434, 436-448**	**390-398, 402, 404, 410-429**	**428.0**	**430-438**
Discharges	99,394	79,384	18,647	14,902
Days	437,897	330,627	93,195	81,585
ALOS	4.4	4.2	5.0	5.5
Total charges	$1,103,241,096	$826,736,297	$157,945,819	$159,494,570
Average charge	$11,100	$10,414	$8,470	$10,703

Source: Maryland Discharge Abstract Data Set, 2002, file created 06/06/2003.
Note: Discharges are reported for all inpatients, including non-Maryland residents.

Pre-Hospital Care

Public access to automated external defibrillators (AEDs) is a recent expansion of the continuum of cardiovascular care for patients who experience pre-hospital cardiac arrest. One of the areas of emerging importance identified by Healthy People 2010 is increasing the proportion of eligible persons with witnessed out-of-hospital cardiac arrest who receive their first therapeutic electrical shock within 6 minutes after recognition of their collapse. Emergency medical services (EMS) systems are evaluating the most effective strategies for using AEDs outside the hospital to reduce sudden cardiac death.

IV. FINDINGS AND RECOMMENDATIONS OF THE LONG TERM ISSUES SUBCOMMITTEE

The Subcommittee on Long Term Issues made recommendations in three major areas: (1) cardiovascular health status; (2) health system organization; and, (3) future research agenda.

CARDIOVASCULAR HEALTH STATUS

Indicators of the cardiovascular health of a population or group include measures of risk factors, morbidity, and mortality. The *Maryland Health Improvement Plan* includes objectives for heart disease and stroke that are intended to improve the cardiovascular health of residents of Maryland. The Healthy Maryland Project 2010 includes the objective to reduce diseases of the heart deaths to no more than 100 per 100,000 population by 2010 (Baseline: 127.5 in 1997; Age-adjusted to 1940).

Figure 11
Heart Disease Mortality in Maryland and the US:
1990-1998, and the HM 2010 Objective.
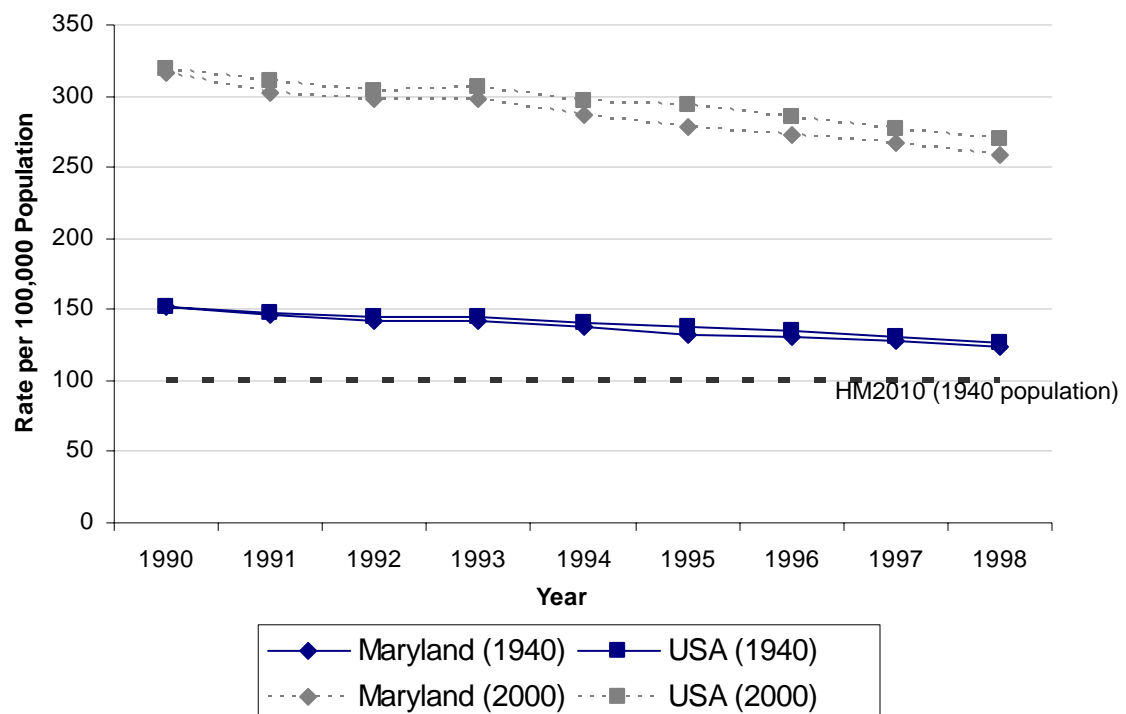
Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 1998*. (Age-adjusted to the 1940 U.S. population.) Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001*. (Age-adjusted to the 2000 U.S. population.) Refer to Appendix B for detailed data, Table B-2a and Figure B-1.

Data reported by the American Heart Association in *Heart Disease and Stroke Statistics-2004 Update* indicates that, based on 2000 age-adjusted death rates, Maryland ranked 32nd for total cardiovascular disease and 30th for coronary heart disease. The Subcommittee on Long Term Issues recommends that Maryland set an additional target, relative to other states, to monitor its progress toward reducing deaths from coronary heart disease.

Given Maryland's standing among other states with regard to socioeconomic measures, Maryland should establish a goal to improve its ranking among states in the nation for age-adjusted death rates for total cardiovascular disease and for coronary heart disease by 2015. Ideally, each hospital in Maryland would serve as a community epicenter for the cardiovascular disease problem by promoting best practices to penetrate communities, linking the science and the population at risk.

Reduction of Death Rates

Rank 24 or less among states arrayed from the lowest to highest in age-adjusted death rates by 2015.

Baseline:
Maryland – 347.1 total cardiovascular disease deaths per 100,000 population in 2000.
Iowa (ranked 24) – 317.5 total cardiovascular disease deaths per 100,000 population in 2000.

Maryland – 187.5 coronary heart disease deaths per 100,000 population in 2000.
Nevada (ranked 24) – 169.3 coronary heart disease deaths per 100,000 population in 2000.

Note: Age-adjusted to the year 2000 standard population.

- *Reduction of disparities in cardiovascular health.*

According to *A Public Health Action Plan to Prevent Heart Disease and Stroke*, what we know about existing disparities indicates that interventions must affect disadvantaged groups more than they do the population as a whole.[26] Because population-based 2010 health objectives for heart disease and stroke have targets that are based on the criterion "better than the best"— groups with poorer baseline status need to experience accelerated improvement, so that all groups will reach the same measures of better health by 2010. This *Action Plan* notes that attaining the targets for these objectives will require that the most effective programs, including those aimed at reducing the prevalence of risk factors, reach the groups with the greatest cardiovascular disease burden.

The Subcommittee on Long Term Issues believes that ensuring that best practices reach all communities will help to reduce disparities in cardiovascular health. The subcommittee supports the use of an approach that addresses the whole population or community as well as the individual patient. Partners should work to identify the elements that make a program effective

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[26] U.S. Department of Health and Human Services. *A Public Health Action Plan to Prevent Heart Disease and Stroke*. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2003.

locally. Using the capacities, skills, and assets of the community to develop policies and activities is one approach to achieving the goal of reducing or eliminating disparities.[27]

Healthy People 2010 identifies clinical preventive care as having a major positive impact on reducing many of the leading causes of disease and death. The Subcommittee on Long Term Issues has selected strategies covering primary and secondary preventive care to achieve the 2010 goal of improving the cardiovascular health of residents of Maryland.

The subcommittee considered a variety of descriptors as an aid in selecting high value targets including: the disorder must occur frequently; have an effective treatment; minority/underutilization; evidence of underutilization of treatment; ease of case finding; treatment complex; treatment costly; untreated mortality; untreated morbidity; programs in place; and prevention – simple or complex. In developing its recommendations, the subcommittee decided to focus on high blood pressure and congestive heart failure.

The Subcommittee selected the prevention, diagnosis, and treatment of high blood pressure as a most important effort because it is common, has quite effective treatment, is not well controlled, and results in reduction of heart disease (including coronary heart disease and congestive heart failure), stroke, and renal failure. The Subcommittee on Long Term Issues notes that heart failure is costly, and leads to poor quality of life and poor survival, and effective treatments have been shown to reduce morbidity and mortality and these treatments are not provided optimally in the community. The subcommittee recommends that the epidemic of heart failure merits future study. The subcommittee recommends a collaborative research project on chronic heart failure that will promote improvements in the management of care for persons with heart failure.

PRIMARY PREVENTION

In a clinical setting, primary preventive measures are those health care services, medical tests, counseling, and health education and other actions designed to prevent the onset of a targeted condition. Heart disease and stroke share several risk factors; the dominant conditions underlying both are atherosclerosis and high blood pressure.

Established in 1972 and coordinated by the National Heart, Lung, and Blood Institute of the National Institutes of Health, the National High Blood Pressure Education Program (NHBPEP) emphasizes the importance of increasing public knowledge about the relationship between hypertension and stroke, and hypertension and heart disease. To help achieve the national Healthy People 2010 objectives, the NHBPEP provides science-based educational materials and programs through its partnerships and extensive distribution network. NHBPEP updated its recommendations regarding primary prevention of hypertension in 2002. Those recommendations emphasize the importance of communities developing and implementing programs that result in increased physical activity, healthy weight, moderate alcohol intake, and consumption of a diet lower in sodium content and higher in fruits and vegetables and low-fat dairy products. According to the NHBPEP, the demonstrated reductions in blood pressure using

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[27] Kretzmann, JP, and JL McKnight. *Building Communities from the Inside Out: A Path Toward Finding and Mobilizing a Community's Assets*, Evanston, IL: Institute for Policy Research, 1993.

lifestyle changes can be as large as those seen in drug studies, can occur in virtually all subgroups of the population, and can be sustained over a long period of time.[28]

Maryland established the State Advisory Council on Heart Disease and Stroke to "develop and promote educational programs in the prevention, early detection, and treatment of heart disease and stroke, targeted to high-risk populations and to geographic areas where there is a high incidence of heart disease and stroke." By law, the Advisory Council recommends that the Department of Health and Mental Hygiene "establish guidelines for the effective management and treatment of heart disease and stroke," including primary prevention. *Annotated Code of Maryland, Health-General Article §§ 13-205, 13-206.* One of the Advisory Council's strategies is to partner with existing organizations.

Risk Factor Awareness

1. Develop a statewide educational program designed to increase awareness of the importance of preventing and controlling hypertension.

    Lead Organization: Department of Health and Mental Hygiene (DHMH)
    Partners: State Advisory Council on Heart Disease and Stroke, Maryland Employers, Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate, Medical-Chirurgical Faculty of Maryland, Area Health Education Centers, Health Plans

2. At the community level, develop and implement programs that result in increased physical activity, healthy weight, moderate alcohol intake, and consumption of a diet lower in sodium content and higher in fruits and vegetables and low-fat dairy.

    Lead Organization: Department of Health and Mental Hygiene (DHMH)
    Partners: State Advisory Council on Heart Disease and Stroke, Maryland Employers, Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate, Medical-Chirurgical Faculty of Maryland, Area Health Education Centers, Health Plans

3. Establish an annual award to recognize outstanding Maryland programs dedicated to primary prevention of heart disease in both the public and private sectors.

    Lead Organization: DHMH
    Partners: Maryland Chapter of the American College of Cardiology, American Heart Association-Mid-Atlantic Affiliate

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[28] Welton, PK et al. Primary prevention of hypertension: clinical and public health advisory from the National High Blood Pressure Education Program. *JAMA*. October 16, 2002, Vol. 288. No. 15, p. 1887.

SECONDARY PREVENTION

Secondary prevention includes measures such as health care services designed to identify or treat individuals who have a disease or risk factors for a disease but who are not yet experiencing symptoms of the disease. Healthy People 2010 lists high blood pressure screening as an example of secondary prevention.

With regard to the detection of sub-clinical coronary artery disease, the Subcommittee on Long Term Issues reviewed information regarding other efforts by NHLBI to find new ways of detecting heart disease early, before it produces symptoms. The Multi-Ethnic Study of Atherosclerosis (MESA), a 10-year, multi-center study that was launched five years ago, will try to determine which factors best predict heart disease in men and women, and in several racial/ethnic groups (white, African American, Hispanic, and Asian). MESA will collect information on standard risk factors for heart disease (high blood pressure, high blood cholesterol, cigarette smoking, diabetes, overweight, physical inactivity, age, and family history of early heart disease) as well as other sociodemographic, lifestyle, and psychosocial factors. It also will examine a variety of newly emerging factors. Results of the study will not be available for several years.[29]

Risk Factor Detection and Treatment

- *Detection, treatment, and control of high blood pressure.*

The National High Blood Pressure Education Program has found that in the last two decades, the number of persons with hypertension who are aware of their condition has increased dramatically. The percentage of persons with hypertension who are on medication and controlling their condition also has improved substantially. However, NHANES III data indicate this trend is leveling off.[30] New strategies to detect treat, and control high blood pressure are needed for special populations where compliance is difficult to achieve.

Treatment and Management of Recurrent Heart Disease

- *Management of care for persons with heart failure.*

Available national data indicate that an estimated 5 million people currently have heart failure.[31] Heart failure has a major impact on the elderly and is the most common Medicare diagnosis-related group, with an incidence of almost 10 per 1,000 persons 65 years and older.

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[29] Bild, D., "Detection of Subclinical Coronary Artery Disease" (presented at the meeting of the Subcommittee on Long Term Issues, Baltimore, Maryland, October 17, 2002).

[30] National Heart, Lung, and Blood Institute, National High Blood Pressure Education Program: Program Description. http://www.nhlbi.nih.gov/about/nhbpep/nhbp_pd.htm; accessed July 2003.

[31] Hunt SA, Baker DW, Chin MH, et al. ACC/AHA guidelines for the evaluation and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee to Revise the 1995 Guidelines for the Evaluation and Management of Heart Failure). 2001. American College of Cardiology Web site. Available at: http://www.acc.org/clinical/guidelines/failure/hf_index.htm.

The magnitude of the problem of heart failure is expected to grow in the future because more cardiac patients are now able to survive heart attacks and other heart problems and live longer with their disease, thus increasing the potential for developing heart failure, and because future growth in the elderly population will likely increase the numbers of persons with heart failure.[32] Therefore, it is necessary to address treatment issues such as which drugs or interventions work best. Available research emphasizes the need for coordinated systems of care for persons with CHF as an approach to reduce hospitalization and improve functional status.[33] [34]

HEALTH SYSTEM ORGANIZATION

The Subcommittee on Long Term Issues considered systems organized to encourage health care facilities to develop and use quality measures to improve the process and outcome of care. The subcommittee recommends that, to reduce illness, disabilities, and deaths caused by heart disease, Maryland should develop an approach to improve collaboration among health care facilities to spread the adoption of evidence-based systems of care.

Early Identification and Treatment

The Subcommittee on Interventional Cardiology was charged with examining and developing recommendations related to the early identification and treatment of persons experiencing a heart attack (acute myocardial infarction). Its recommendations on pre-hospital and hospital management of acute ST-segment elevation myocardial infarction are included in *Advisory Committee on Outcome Assessment in Cardiovascular Care: Report of the Interventional Cardiology Subcommittee*, June 2003.

Early access to emergency health care services is a critical determinant of outcome for victims of out-of-hospital cardiac arrest. Sudden cardiac death (SCD) is the most common fatal manifestation of heart disease, and in many cases it is the individual's first and only symptom. Reducing the proportion of out-of-hospital SCDs would decrease the overall incidence of premature death.

Use of automated external defibrillators (AEDs) to treat ventricular fibrillation (VF) has been shown to be a critical link in the chain of survival for cardiac arrest.[35] AEDs administer an electric shock to the heart to restore normal heart rhythm. To be most effective, defibrillation following the onset of VF must be prompt.

Maryland has enacted legislation to establish an Automated External Defibrillator Program, administered by the State Emergency Medical Services (EMS) Board. The AED Program provides "a means of authorizing a facility to make automated external defibrillation

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[32] National Heart, Lung, and Blood Institute, National Institutes of Health. *Data Fact Sheet: Congestive Heart Failure in the United States: A New Epidemic*. September 1996.

[33] Grady, KL et al. Team management of patients with heart failure. *Circulation*. 2000; 102:2443-2456.

[34] Krumholz, HM et al. Evaluating quality of care for patients with heart failure. *Circulation* 2000; 101: el22-e140.

[35] American Heart Association. Chain of Survival and Cardiac Arrest. Available at: http://www.americanheart.org/presenter.jhtml?identifier=6980.

available to an individual who is a victim of sudden cardiac arrest if physician services or emergency medical services are not immediately available." Education Article § 13-517.

The Maryland Institute for Emergency Medical Services Systems (MIEMSS) is the State agency that implements the AED Program. Through the Maryland Cardiac Arrest Public Defibrillation (M-CAPD) Study, MIEMSS is collecting data to determine the incidence and location of out-of-hospital cardiac arrest, evaluate Maryland's public AED Program, and improve patient outcome from cardiac arrest. Information about the feasibility of public access to defibrillation will also be available from a large multi-center study funded by NHLBI and the American Heart Association. The 2½-year trial, which began in the summer of 2000, focuses on trained, volunteer non-medical responders who quickly identify and treat persons with out-of-hospital cardiac arrest.

- *Early identification and treatment of persons with out-of-hospital cardiac arrest.*

The Subcommittee on Long Term Issues agrees that it is important to address issues related to the strategic placement of AEDs within the state. The subcommittee believes that placement, maintenance, and training issues can be addressed best by working with the Maryland Institute for Emergency Medical Services Systems. By increasing the number of AEDs in communities and the number of people in those communities who are trained to use AEDs, outcomes for individuals in sudden cardiac arrest will improve.

Automated External Defibrillators

4. Through utilization of existing and on-going statewide cardiac arrest data, develop a strategy to increase the number of Maryland residents with access to automated external defibrillation at pre-identified high-risk public locations.

   Lead Organization: Maryland Institute for Emergency Medical Services Systems
   Partners: DHMH, Medical-Chirurgical Faculty of Maryland, American Heart Association-Mid-Atlantic Affiliate, Maryland Health Care Commission

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Access to Evidence-Based Care

- *Measurement and improvement of systems of cardiac care.*

The most current scientific evidence should be used to develop measures of the quality of cardiac care. Translating that evidence into practice on a broad scale will require an approach that is compatible with community objectives and resources.

There are many strategies on how to increase knowledge about process and results of cardiac care. Communicating from the outset to create awareness, gaining early support from national opinion leaders, using participants to spread the knowledge from research or practice, and identifying and cultivating "leaders" in communities, are all ways in which systems of

cardiac care can be improved. Regular process evaluation with feedback from community partners and providers is likely to help improve community-based programs.[36]

- *Reduction of disparities in cardiovascular health care.*

<u>Clinical Practice</u>
The Institute of Medicine defines disparities in health care as racial or ethnic differences in the quality of health care that are not due to access-related factors or clinical needs, preferences, and appropriateness of intervention.[37] A large number of studies have documented racial and ethnic differences in care for heart disease. According to a recent study by the Kaiser Family Foundation and the American College of Cardiology Foundation, the strongest studies provide credible evidence that African-Americans are less likely than Caucasians to receive diagnostic procedures, revascularization procedures, and thrombolytic therapy, even when patient characteristics are similar.[38] This review also found that disparities in receipt of appropriate care remain after adjusting for factors known to affect care such as age, sex, insurance status, co-morbidities, and heart disease severity.

Promoting the use of evidence-based guidelines is one strategy to address potential underuse of cardiovascular risk reduction care and utilization of preventive therapies among African-Americans. The American Heart Association has implemented a national initiative to improve the secondary prevention of cardiovascular disease and reduce the risk of recurrent heart attacks and strokes. Its *Get with the Guidelines* program enables health care professionals to apply proven measures while the patient is hospitalized. The *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: JNC 7 Express* observes that previous JNC reports have not been used to their maximum benefit.[39] Similarly, the ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult note that the publication of evidence-based guidelines has not eliminated the suboptimal care of patients with heart failure. Key processes of care are underutilized. Two areas of implementation have been identified: (1) more intensive educational efforts along with the dissemination of practice guidelines, and (2) disease-management programs.

The American College of Cardiology (ACC) launched the Guidelines Applied in Practice (GAP) Program with a project in February 2000 to learn whether providing assistance with guideline implementation could help reduce this gap between the care recommended in guidelines and that delivered in practice.

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[36] Nolan, T.W., Presentation at the meeting of the Subcommittee on Long Term Issues, Baltimore, Maryland, January 22, 2003.
[37] Institute of Medicine, Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, National Academy Press, 2002, page 4.
[38] The Henry J. Kaiser Family Foundation and American College of Cardiology Foundation. *Racial/Ethnic Differences in Cardiac Care: The Weight of the Evidence*. October 2002.
[39] U.S. Department of Health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, *Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: JNC 7 Express,* NIH Publication No. 03-5233, May 2003.

GAP investigators have found:[40]

- Statistically significant increases in performance indicators for Medicare patients for early treatment with aspirin and beta blockers and for later treatment use of aspirin and smoking cessation counseling when compared to the control group
- Improvement for other indicators, though not statistically significant
- Highly significant improvement in most indicators when the GAP tools were used.

A study conducted by Princeton Survey Research Associates found that in addition to decreased access to health care, Hispanics, Asians, and African-Americans are still more likely than Caucasians to have difficulty communicating with their doctors about their health issues. The communication issues went beyond simple language barriers; patients in the study reported not fully understanding their doctors and feeling as though their doctors were not listening to them.[41] Therefore, improving communication between doctors and patients is another strategy to address cardiovascular risk reduction among minorities.

Community Partnerships

With regard to other strategies, the Subcommittee on Long Term Issues reviewed information regarding partnerships between experts in medical care, health care and research, and community leaders. The University of Texas at Southwestern, for example, has begun to implement an innovative program for blood pressure control in barbershops. These kinds of partnerships have the potential to reduce disparities in cardiovascular health in both rural and urban communities.

As noted by the Joint National Committee, the likelihood of acceptance by the community (as well as effectiveness in reducing a population's morbidity, mortality, and risk) increases when public health intervention strategies address the diversity of racial, ethnic, cultural, linguistic, religious, and social factors in the delivery of their services. For example, African Americans use preventive services very differently than their Caucasian counterparts, independent of socioeconomic status. Data also suggest that access to appropriate culturally acceptable models of care delivery has been a major barrier to coronary disease prevention in African Americans.[42] In a recent report on approaches to address racial and ethnic disparities in health care, the United States General Accounting Office listed several examples of interventions by the federal government and private sector (e.g., employers and health plans): disease prevention programs, disease management programs, health literacy and language services, and education and outreach programs targeting specific populations.

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[40] Mehta RH et al. Improving Quality of Care for Acute Myocardial Infarction: The Guidelines Applied in Practice (GAP) Initiative. *Journal of the American Medical Association.* 2002;287:1269-1276.

[41] Hohman, K. Race and Health: Examining racial disparities in healthcare. Available at: http://racerelations.about.com/library/weekly/blracehealth.htm; accessed July 2003.

[42] Becker, D., "Building a Gateway to a Partnership in Health Research in African American Communities" (presented at the meeting of the Subcommittee on Long Term Issues, Baltimore, Maryland, December 12, 2002).

FUTURE RESEARCH AGENDA

Healthy People 2010 has identified population studies and public outreach as two of the most important areas of future research. Included among the emerging areas of research are detection of sub-clinical cardiovascular disease, the effect of socioeconomic status on health, health status in rural populations, and quality of life as a measure for evaluating treatment.

The Subcommittee on Long Term Issues identified areas of future research: assessing the effect on disparities of community-based prevention initiatives; identifying ways to improve care for people with chronic cardiovascular disease; and, developing measures to assess quality in terms of adherence to accepted processes and anticipated outcomes.

Differences in Treatment of Heart Disease

- *Race and gender differences in treatment of heart disease.*

The subcommittee supports improvements in knowledge and research about women's cardiovascular health and treatment. Future research should also assess whether optimal use of proven therapies is implemented among racial minorities. Although much is known about cardiovascular disease and its associated risk factors, knowing more about race and gender differences in treatment of heart disease is important. For example, studies have provided evidence that many women who suffer heart attacks are not getting adequate treatment, and that doctors often fail to prescribe beta blockers and cholesterol-lowering drugs to these women, even though these medications have been proven to prevent further heart attacks.[43]

Heart Failure: Patient Outcomes Clinical Trial

- *Management and outcomes of care.*

The ACC/AHA Guidelines for the Evaluation and Management of Chronic Heart Failure in the Adult note that many patients with heart failure are members of subpopulations; however, many subgroups, including women and men, racial minorities, and elderly patients, are underrepresented in most clinical trials. The subcommittee supports further research to address the issues surrounding disparities in the management of care for persons with heart failure.

The Subcommittee on Long Term Issues considered the concept of a clinical trial on congestive heart failure.[44] The proposal described a prospective, randomized comparison of usual (current) care with multidisciplinary disease management. The hypothesis is disease management will reduce morbidity and mortality, reduce cost, and improve quality of life for patients with congestive heart failure.

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[43] McAuliffe, K. Women and Heart Attacks. Available at: http://www.buildingbetterhealth.com/topic/hawomen; accessed July 2003.

[44] Aversano, T., "Heart Failure: Patient Outcomes Clinical Trial" (presented at the meeting of the Subcommittee on Long Term Issues, Baltimore, Maryland, June 5, 2002).

Congestive Heart Failure

5. Support a collaborative research project to study approaches to improving the management of congestive heart failure.

    Lead Organizations: University of Maryland School of Medicine, Johns Hopkins School of Medicine
    Partners: Maryland Hospital Association, Maryland Health Care Commission, Medical-Chirurgical Faculty of Maryland, Health Plans

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Development of Quality Measures

- *Valid measures supported by evidence.*

The Subcommittee on Quality Measurement and Data Reporting was charged with reviewing experience with different approaches to quality improvement for cardiovascular services at the national, state, and regional levels. The Subcommittee on Long Term Issues also received information on the use of quality measures for accountability, and improvement within and across institutions or systems of care. The Subcommittee on Long Term Issues believes that the measures that are used as benchmarks or indicators of the quality of cardiovascular care should be supported by sound scientific evidence and modified to reflect substantial current research. The subcommittee supports quality measurement because it will encourage quality improvement.

Appendix A.

Meeting Minutes: Long Term Issues Subcommittee

June 5, 2002

July 25, 2002

October 17, 2002

November, 2002

December 12, 2002

January 22, 2003

Summary of the Meeting of the
Advisory Committee on Outcome Assessment in Cardiovascular Care
Long Term Issues Subcommittee

June 5, 2002
Conference Room 110, Metro Executive Building, 4201 Patterson Avenue,
Baltimore, Maryland 21215

Subcommittee Members Present

Eugene R. Passamani, M.D., Chairman
Patricia Casals
Donald H. Dembo, M.D.
Sheila Druck, R.N., BSN
Aaron Kenigsberg, M.D.
George Moran, M.D.
Lisa Myers, R.N., M.S.
John M. Ryan, M.D.
Cheryl VanKuren

Subcommittee Members Absent

Jane R. Apson, M.S.P.H., Ph.D.
Irene Buadoo, M.D.
Lynn Frank, F.A.C.H.E.
Kenneth Rempher, R.N.

Members of the Public Present

Andrew G. Cohen, Consultant
Angelyn B. Estwick, Master of Public
  Health Candidate, George Washington
  University
Vanessa Purnell, MedStar Health

Guest Speakers

Jeanette Jenkins, Director, Office of Health
  Policy, Community Health
  Administration, DHMH
Edward K. Kasper, M.D., Associate
  Professor of Medicine, Director,
  Cardiomyopathy and Heart Transplant
  Service, Johns Hopkins School of
  Medicine
Thomas Aversano, M.D., Cardiologist,
  Johns Hopkins School of Medicine

Commission Staff Present

Barbara G. McLean
Pamela W. Barclay
Dolores Sands
Bridget Glazebrook
Susan Panek
Debbie Rajca
Colleen Lates

1. **Call to Order and Introductions**

Eugene Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:00 p.m. Members of the Long Term Issues Subcommittee, guest speakers, and Commission staff introduced themselves.

2. **Overview and Background**

Dr. Passamani asked Barbara G. McLean, Executive Director of the Maryland Health Care Commission, to provide an overview of the Commission. Ms. McLean thanked the

subcommittee members and guest speakers for taking time from their busy professional and personal lives to participate in generating discussions relating to long term care issues. Then Ms. McLean provided a brief overview and description of the activities and programs of the Commission. Ms. McLean also stated that the four Subcommittees (Quality Measurement and Data Reporting, Interventional Cardiology, Long Term Issues, and Inter-Hospital Transport) would discuss ideas for future direction and relay their recommendations and proposals to the Steering Committee for consideration.

Ms. Jenkins questioned if there were plans to merge the four separate Subcommittees into the Steering Committee. Ms. McLean responded that each Subcommittee Chairman is a link to the Steering Committee. In this capacity, the Chairman may directly report each Subcommittee's activities to the Steering Committee, thereby reducing the need for all members to spend their valuable time attending additional meetings. Ms. Barclay added that at least one member on a Subcommittee was a member of the Steering Committee. In the case of the Long Term Issues Subcommittee, Donald Dembo, M.D. is a dual participant in addition to Dr. Passamani.

Dr. Passamani asked Pamela W. Barclay, Deputy Director for Health Resources, to provide an overview of the goals of the Advisory Committee and how it relates to the Subcommittee on Long Term Issues. Ms. Barclay distributed an organizational chart that illustrated the four primary focus areas of the Long Term Issues Subcommittee. These areas include Access, Health Status, Research, and Health System Organization. The activities in these areas should be considered "work in progress" that may be modified over time. According to Ms. Barclay, the four subcommittees have many interconnections. It is the function of the Steering Committee to work with the four separate subcommittees and connect them by identifying strategies toward reaching overall goals. Ms. Barclay explained that while the time frame for the Advisory Committee is ambitious, it is achievable. The Advisory Committee is expected to submit an initial report to the Commission over the summer. A final report is due to the Commission by January 1, 2003.

Aaron Kenigsberg, M.D. questioned if any figures had been considered regarding the cost of medicines. He stated that there might be an interest in getting people in Maryland on lower cost drugs, such as generic prescriptions. Dr. Passamani said he did not recall that drug costs had been a topic of discussion. However, Dr. Passamani said the Subcommittee could discuss this issue, as well as any other matters pertaining to cardiac care. According to Dr. Passamani, the Subcommittee should consider if there are other areas in patient care that should be placed higher on the agenda. He said that congestive heart failure is just one area that is to be considered.

Dr. Dembo asked if other organizations in the State were examining the same patient care areas. He suggested that the Subcommittee should communicate with other organizations so that there is no duplication of studies being made.

Ms. McLean explained that Delmarva is currently collecting data on the Commission's behalf and that staff is in daily contact with that agency. Plans are also being made to announce meetings all of the Subcommittees in the public hearing schedule to increase awareness of the Commission's work in the area of cardiovascular care.

**3.	Presentation: Healthy Maryland Project 2010 – Options for Cardiovascular Disease Assessment/Target Setting**

Ms. Jeannette Jenkins presented the goals of the Healthy Maryland Project 2010 with respect to Cardiovascular Disease. She advised that much of her information was downloaded from the Healthy People 2010 website which is located at http://mdpublichealth.org. Ms. Jenkins said that the previous goals of Healthy People projects had been to reduce or control health problems. Under the 2010 project, the primary goal is to eliminate health disparities and increase quality and years of healthy life. Healthy People 2010 is a comprehensive set of national health objectives for a ten-year period.   These objectives are developed by a collaborative process and are designed to measure progress over time.   According to Ms. Jenkins, there are 10 Leading Health Indicators (LHI) that reflect the major public health concerns in the United States. These indicators are: (1) physical activity, (2) overweight and obesity, (3) tobacco use, (4) substance abuse, (5) responsible sexual behavior, (6) mental health, (7) injury and violence, (8) environmental quality, (9) immunization, and (10) access to health care.   The second indicator, overweight and obesity, closely relates to the subject area of cardiovascular disease since overweight individuals are often affected with heart disease.

Ms. Jenkins stated that the Healthy Maryland Project 2010 contains a Health Improvement Plan (HIP) that includes statewide modules as well as local modules. Consequently, this ongoing report concentrates the efforts of both state and local health departments, and the appendices provide a linkage between their findings. Ms. Jenkins pointed out that research has always been conducted on a "shoestring budget," however; LHI's should still be measurable down to the local level.

Related objectives from other focus areas indicate that there is overlap in other health areas where heart disease and stroke are considered. For example, persons with chronic kidney failure often suffer from cardiovascular disease. Healthy People 2010 examines objectives for improving these health issues. Ms. Jenkins stated that the 2010 data are age adjusted to the 2000 standard population. This objective differs from Healthy People 2000 that adjusted the death rates using the 1940 standard population.

Ms. Jenkins described the Healthy People 2010 "Toolkit" that sets out the vision, goals, objectives, baselines, and targets that are used by participants during the planning process. She stated that it was important that objectives be measurable. Additionally, continuity and comparability are vital in reaching the goals of Healthy People 2010.

Andy Cohen asked how each county selected a priority area to examine. Ms. Jenkins said that several counties conducted their own research. Healthy People 2010 allowed local health departments to choose one priority at first, but this method did not work because each county tended to select infant mortality.   Since variety was needed, other priorities were recommended and subsequently chosen.

Thomas Aversano, M.D. questioned how the baseline for coronary heart disease deaths went from 200 to 160. Ms. Jenkins replied that various factors, such as different behaviors, were

considered. Healthy People 2010's Heart Disease and Stroke section (12-1) provides information regarding reducing coronary heart disease deaths. In 1998, the baseline for coronary heart disease deaths was 208 while the 2010 target is 166.

4. Presentation: Heart Failure

Edward Kasper, M.D. presented a profile of the compelling problem of heart failure in the United States. He said that heart failure is a common pathway for other medical problems. Data show that 4.8 million people have heart failure in the United States. Of these diagnoses, 60 percent are due to coronary heart disease. Each year, between 400,000 and 700,000 new cases of heart failure are diagnosed. During the same period, 250,000 people die of heart failure. The number of heart transplants per year is approximately 4,000. Of those individuals hospitalized with heart failure, 80 percent are older than 65 years. As a result, more Medicare dollars are spent for heart failure than for any other diagnosis. In addition, $500 million is spent annually on drugs related to heart failure.

According to Dr. Kasper, the "Rule of Halves" and "Second Rule of Halves" can best illustrate statistics relating to heart failure. The Rule of Halves shows that one-half of patients are treated, but have no heart failure. Another quarter of patients have heart failure and diastolic left ventricular dysfunction (LVD) while the final quarter of patients have heart failure and systolic LVD. Regarding the Second Rule of Halves, one-half of patients have few or no symptoms of heart failure, while one quarter has heart failure, and the remaining quarter has heart failure and receives the appropriate therapy. Although 30 percent of patients exhibit diastolic dysfunction, 70 percent of patients show signs of systolic dysfunction.

Dr. Kasper discussed the marked change in phenotype, including increased adrenergic activity. In his analogy, Dr. Kasper pointed out that the key concept of change was the "remodeling" of the left ventricle from an "ellipse" shape to a "beach ball" shape. Also, it has been demonstrated that ACE inhibitors reduce mortality in moderate and severe heart failure. Dr. Kasper said there had been a host of trials regarding various beta-blockers, however, it was still difficult to treat patients with heart failure. Certain drugs, such as diuretics, are used in conjunction with heart medications for the management of such medical conditions as edema. By controlling accompanying medical problems, critical patients are often kept out of the hospital. Digoxin has been shown to have no affect on mortality; however, it improves functional capacity and decreases hospitalization rates. REMATCH is a device that is used in very sick patients. Studies show that there is a 48 percent reduction in the risk of death in patients given LVAD when the REMATCH device is used. Improved quality of life is also noticed when the device is used.

Different countries have heart failure compliance guidelines. In the United States regarding LVEF, it is common to see that 70 percent of patients have ejection fraction measured at some point in their care. Data indicate that most patients with systolic dysfunction should be on ACE inhibitors. In addition, hospital readmission rates suggest that improvements could be made in the quality of care patients are receiving.

Dr. Kasper discussed a study that was conducted regarding 200 patients who were at high risk for hospital readmission for heart failure. The patients were randomized to multidisciplinary care or usual care for a six-month intervention at two clinical sites, Bayview and Johns Hopkins. The results of the project showed there were 43 chronic heart failure (CHF) hospitalizations and 7 deaths in the intervention group. There were 59 CHF hospitalizations and 13 deaths in the usual care group. Both quality of life and quality of care improved with intervention. The cost was approximately the same in 1998 dollars.

There are some problems associated with intervention care. For example, nurse practitioners can only follow 30 to 50 heart failure patients, and it is sometimes difficult to obtain physician cooperation. Additionally, not all patients need such an expensive intervention and funding is also an issue. Co-morbidities also become critical in this patient population.

A Tele-Watch System was then discussed. This is a computerized system of follow-up care in which patients call into the system on a daily basis and are asked approximately ten varied, simple questions. Information is graphically displayed and there are modules for heart failure, diabetes, and COPD. The system is currently being tested within the Johns Hopkins system.

Dr. Kasper concluded his presentation by summarizing the problems associated with heart failure. He said that heart failure is a disease of the elderly and is growing because our population is aging. Treatment for heart failure is also complex and at times difficult to administer. Additionally, it is often difficult to prove benefit in a large cohort using a disease management approach. Dr. Kasper stated that randomizing patients is an important method for studying how to improve quality care for heart failure patients.

Dr. Passamani commented that the State of Maryland had a very good data system. He asked if there was a technology transfer system, or a means whereby the State would look into and reconnect with a pilot system. Dr. Kasper responded that he would be happy to look at the data. He also said he envisioned a multi-center approach with much support, one that would report the findings of 2,000 patients instead of only 200.

Dr. Dembo stated that no money was saved in this project. He said the problem is that under the current system of care, patients are not benefiting from the best there is available. If we had an organized method of following patients who were not terminally ill, the system would be improved. Dr. Kasper explained that the data in his presentation pertained to mostly Class 3 patients. He also said that we needed to pinpoint the costs correctly the next time. Dr. Kasper added that nurse practitioners were very well trained in treating heart failure patients.

5.   **Presentation - Heart Failure: Patient Outcomes Clinical Trial**

Dr. Aversano presented information concerning his concept for a prospective, randomized comparison of usual care with multidisciplinary disease management for heart failure patients. He said that this Heart Failure Patient Outcomes Clinical Trial study could be very important in terms of understanding heart failure. According to Aversano, three areas should be considered when studying the care of heart failure patients: (1) assurance of quality,

(2) access to care, and (3) containment of cost. In his view, there is now a poor track record concerning quality of care for heart failure patients.

The Commission can take several steps to promote better quality of care. These measures include: (1) supporting the concept of a patient outcomes trial relating to heart failure, (2) creating a necessary regulatory environment to allow studies to proceed, (3) becoming a "co-investigator," (4) assisting researchers in getting the attention of the Centers for Medicare and Medicaid Services (CMS), and (5) promoting the concept to the Maryland healthcare community. There are several factors that help to make Maryland a good area to implement these measures. For instance, cooperative ties already exist through systems like the Cardiovascular Patient Outcomes Research Trial (C-PORT) project. Also, because Maryland is a small state geographically, it is easier to obtain assistance in gathering data. In addition to having two major medical centers with clinical experts in the field of health failure, Medicare is located within the state.

Disease management, particularly regarding a chronic disease such as heart failure, can be a sensible approach to improving treatment. Currently, heart disease is extremely costly to the healthcare system and there are multidisciplinary and fragmented approaches to treatment. Disease management can lead to rapid development of new treatment strategies and options. By doing so, patients can be empowered with cognitive, behavioral, measurement, and reporting tools that (1) reduce system demand and cost, (2) increase compliance, and (3) enhance clinical outcomes. Using a disease management system, data is submitted from the patient and/or nurse, but the patient ultimately manages his own disease. Disease management tools such as self-assessment screeners and individualized treatment plans apply to different strata of risks.

The annual cost for a chronically ill patient is approximately $30,000 per year. Disease management could decrease costs and reduce the mortality associated with chronic disease. Regarding heart failure, a usual care vs. intervention study could be conducted comparing patients with mild, moderate, and severe medical conditions. Patients could be followed for a least one year to determine differences regarding medical outcomes, quality of life issues, and economic circumstances. Various technical issues would have to be considered regarding the study such as (1) patient population source, (2) how to identify, randomize, and stratify, (3) guidelines and treatment algorithms, (4) how to apply guidelines, and (5) medical-legal issues. Funding could potentially be provided by CMS, the Agency for Healthcare Quality and Research, third party payers, and private employers.

According to Dr. Aversano, the study is important because chronic heart failure is increasing in the population at epidemic proportions. Not only does quality of care vary widely among chronic heart failure patients, but outcomes for these patients also vary. Additionally, the economic burden of chronic heart failure is very high. Dr. Aversano concluded that the study would fulfill one of the missions of the Commission by assuring the greatest access to the highest quality care at the lowest cost.

6. Subcommittee Discussion

Dr. Passamani commented that better care might reduce costs related to heart failure. Dr. Aversano agreed and stated that there are many underserved patients in Maryland. Fifty percent of the underserved are African Americans and this figure is out of proportion when compared to other races. Dr. Kasper added that the rate for underserved African American males was much higher than for white males. According to Dr. Aversano, patients spend much of their time traveling to the offices of their physicians. This time would be decreased through the use of disease management because part of patients' follow-up care would be performed via the telephone.

Dr. Kenigsberg asked if prevention might not be a better method of treating heart disease. He suggested treating patients who were 40 or 50 years of age for problems that lead to heart disease before the problems actually occurred. Dr. Aversano replied that the cost of preventive treatment was high and the cost of heart failure continued to rise.

Dr. Passamani stated that it was difficult to talk to a person who feels healthy about problems that could occur in the future. However, one of the reasons the Subcommittee was formed was to discuss ideas and attempt to find various approaches to reducing heart failure in Maryland.

Dr. Aversano said there has always been a concern about prevention. He provided the example of tobacco company Philip Morris' anti-smoking campaign. Figures revealed that smoking actually increased in spite of the prevention tactics that were taken. Ms. Jenkins commented that it was important how an organization crafts its message. Dr. Kenigsberg added that it was important to educate the State of Maryland about heart failure disease.

George Moran, M.D. mentioned there were high costs involved with end-of-life patients that had to be considered regarding heart failure. If patients receive one high bill for pills or medical visits, they will not return for treatment. He said he did not know how to include this concern in the State Health Plan.

Dr. Dembo commented that Maryland did not do a bad job regarding wellness. He provided the example of offering children shots to prevent diseases. Dr. Dembo said that there were rewards for wellness and punishments for not offering it. It is difficult to provide preventive measures when comorbidity is involved. Physicians, he said, should become more responsible for prevention of health problems that are related to adults. It is necessary to develop a prevention system for adults like the one that Maryland currently offers to babies and children. Dr. Dembo also suggested that high blood pressure and diabetes should also be considered in connection with heart failure.

Dr. Passamani asked each member to consider the next steps that should be taken and invited everyone to write him a note, in care of Ms. Barclay, responding to the format and issues that were discussed during the meeting. Dr. Passamani also requested that each member select a few items on which to focus during the upcoming report. He said that since the final report was due in January 2003, a preliminary report should be drafted by October 2002. Drs. Kasper and

Aversano said they would forward copies of their slide presentations to Ms. Barclay. Dr. Passamani then thanked everyone for participating in the meeting.

7. Future Meeting Schedule

Dr. Passamani said he would like the Subcommittee to meet one more time before August 2002. He requested that members include dates when there were available, as well as topics for presentations, and include this information when they submitted their notes to Ms. Barclay.

8. Other Business

There was no other business.

9. Adjournment

The meeting adjourned at 8:15 p.m.

Summary of the Meeting of the
Advisory Committee on Outcome Assessment in Cardiovascular Care
Subcommittee on Long Term Issues

July 25, 2002
Conference Room 108-109, Metro Executive Building, 4201 Patterson Avenue, Baltimore,
Maryland 21215

Committee Members Present
Eugene R. Passamani, M.D., Chairman
Jerilyn Allen, Ph.D.
Jane R. Apson, M.S.P.H., Ph.D.
Patricia Casals
Donald H. Dembo, M.D.
Sheila Druck, R.N., BSN
Stacey Fisher, M.D.
Lynn Frank, F.A.C.H.E.
Jeanette Jenkins
Aaron Kenigsberg, M.D.
George Moran, M.D.
Lisa Myers, R.N., M.S.
Kenneth Rempher, R.N.
John M. Ryan, M.D.

Commission Staff Present
Barbara G. McLean
Pamela W. Barclay
Dolores Sands
Bridget Glazebrook
Susan Panek
Debbie Rajca
Colleen Lates

Guests Present
Martha Nathanson, Sinai Hospital

Committee Members Absent
Irene Buadoo, M.D.
Ruth Maiorana
Cheryl VanKuren

1.   Call to Order and Introductions

Eugene Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:00 p.m. Members of the Long Term Care Subcommittee and Commission staff introduced themselves.

2.   Approval of the Previous Minutes (June 5, 2002)

The minutes were approved as submitted.

3.   Overview and Background

Pam Barclay provided an update on the Steering Committee as well as updates on the other subcommittees. She explained that the Subcommittee on Long Term Issues would be provided with the minutes of the other subcommittees since all of the subcommittees were

interconnected. In particular, the other subcommittees discuss some overlapping, long-range issues that would be of interest to the Subcommittee on Long Term Issues.

According to Ms. Barclay, the Steering Committee is expected to meet in September. A schedule of the Committee's upcoming meetings, as well as minutes from these meetings, will be provided to the Subcommittee on Long Term Issues. Ms. Barclay stated that two distinguished guest speakers, Kenneth I. Shine, M.D., Chairman of the New York State Cardiac Advisory Committee, and James L. Field, Director of the Cardiovascular Roundtable, Advisory Board Company, attended previous Steering Committee meetings and presented useful information regarding challenges and trends in cardiovascular services. Summaries of their presentations are included in the minutes that will be distributed.

On Wednesday, July 31, 2002, the Quality Measurement and Data Reporting Subcommittee is scheduled to meet. Plans are also underway to schedule a joint meeting in early October between the Quality Measurement and Data Reporting Subcommittee and the Steering Committee. It is anticipated that the guest speaker will discuss regional quality improvement efforts in the New England area.

The first meeting of the Inter-Hospital Transport Subcommittee is scheduled for Thursday, August 22, 2002. Likewise, the Interventional Cardiology Subcommittee has not held its first meeting.   Ms. Barclay announced that David Williams. M.D., an interventional cardiologist from Rhode Island, has agreed to chair the subcommittee and plans are being made to schedule a date for the first meeting. Dr. Passamani reiterated that all subcommittee members would be receiving copies of all subcommittee minutes in addition to the schedules for all meetings. The meetings are open to the public, and all subcommittee members are encouraged to attend related cardiovascular discussions.

Barbara McLean advised that the meeting schedules would be posted on the Commission's web site and in the legislative hearing schedule.

4.   **Presentation: Background Material on Cardiovascular Disease in Underserved Populations**

Dr. Passamani advised that the guest speaker, Diane Becker, Director, Johns Hopkins Center for Health Promotion, was unable to attend this evening's meeting. However, Dr. Becker has agreed to speak at the next scheduled Long Term Issues Subcommittee meeting.

5.   **Discussion on Potential Focus Areas**

A total of nine letters were received in response to Dr. Passamani's June 5, 2002 request for recommendations concerning potential focus areas related to cardiovascular care. Dr. Passamani explained that the Maryland Health Care Commission and the Steering Committee should be thought of as catalysts in developing methods to reduce cardiovascular disease through process improvement in Maryland. As a starting point for the Long Term Issues Subcommittee's discussion, Dr. Passamani presented a series of criteria that might be of use in selecting areas of

focus for the subcommittee. (The model, incorporating the suggestions of the Subcommittee members, is attached.)

Dr. Passamani commented that he had noticed some tension in the nine letters that were received with respect to primary and secondary prevention measures. Ms. Lynn Frank suggested that there were significant disparities that should be noted. Ms. Jeanette Jenkins recommended that prevention be added to the model.

Aaron Kenigsberg, M.D. agreed that prevention should be included. He also stated that pharmaceutical representatives tend to promote expensive drugs when they should be providing samples of less expensive drugs. Dr. Kenigsberg suggested that Maryland could set up organizations that promote providing samples of low cost, generic medications to patients, instead of starting patients on higher-costs drugs. Ms. Barbara McLean noted that CareFirst Blue Cross/Blue Shield was encouraging patients to ask their physicians for generic medications.

Donald Dembo, M.D. stated that the subcommittee needed to consider the resources required for health care. He added that the staff that is required is expensive. Dr. Dembo also said that it was necessary to prioritize how we deal with the limited resources that are available. Dr. Passamani related an incident where several firefighters were killed while fighting a fire because their procedures and approaches no longer fit the problem (Don Berwick's presentation at Johns Hopkins Hospital two years ago). His analogy suggested that perhaps the cardiovascular medicine model needs adjustment. With the state serving as a catalyst, Dr. Passamani suggested that research and education might lead to ideas of how the model could become more focused. Stacey Fisher, M.D. said that the dysmetabolic syndrome population should be added to the model. She added that this medical condition was driven by many factors, including obesity.

Ms. Lisa Myers discussed the public access defibrillation program that is administered by the Maryland Institute of Emergency Medical Services Systems (MIEMSS) under the authority of the Emergency Medical Services Board. Facilities that meet certain criteria are authorized to obtain and maintain automated external defibrillators (AEDs) on-site by appropriately trained non-medical personnel before the arrival of emergency medical services personnel. An authorized facility could be a single organization located at one place or a business that operates at several locations (sites). Currently, there are 177 registered AEDs and 320 sites in Maryland.

Dr. Fisher advised that places such as shopping malls and airports have AEDs. Ms. Myers added that BWI Airport also has AEDs in place. Three lives have been saved due to the use of the defibrillators at BWI Airport.

Dr. Passamani suggested that each subcommittee member express his or her view regarding the model, and suggest ways in which the model could be developed. Dr. Kenneth Rempher stated that good data was needed to support analysis of any disease process. He suggested that the subcommittee compare the current and desired methods.

Dr. Kenigsberg said that aspirin should be prescribed before a stroke occurs. He said a patient could get "more bang for the buck" if a generic drug was used in the early treatment of

such a disease. In his opinion, medical providers failed if a patient died at 40 years of age, but did not fail if a patient died at 90. Dr. Passamani commented that asymptomatic individuals at a high risk of heart disease are hard to identify and that it was difficult to get patients who feel well to commit to preventive medicine. Dr. Kenigsberg mentioned that society had changed since the 1950s so perhaps people would be more open to preventive medicine now.

Dr. Moran suggested there was confusion regarding the scope of the Subcommittee. He asked if the subcommittee was looking to generate standards. Dr. Moran also suggested that the subcommittee take the best practices that are known and utilize them better. Dr. Passamani said that perhaps the subcommittee could measure how Maryland compares to the best practices of other states.

Dr. Dembo commented that technological advances were continuing. He said defibrillators would probably be on people's wrists by 2005. However, Dr. Dembo said there were disparities concerning the underserved population. Fifteen years ago, there was disparity in access and the disparity continues. He asked how we could get individuals into the system, because that is where the medical community has failed. Dr. Dembo added that we should take advantage of the entities that are available such as churches and barber shops to educate the public.

Ms. Sheila Druck stated that some existing programs had been included in Cheryl VanKuren's follow-up letter to the June 5, 2002 subcommittee meeting. Ms. Druck suggested that the subcommittee should compile the information and determine the best practice. Dr. Passamani commented that communication between a physician and a patient is not the sole method for building support associated with cardiovascular education. A complementary method might also be used. Ms. Patricia Casals suggested that there should be education for the medical and non-medical community.

Ms. Myers suggested that the subcommittee pick one primary and one secondary preventive measure. She said that one is as important as the other. Ms. Myers also stated that AEDs were a step further than CPR. Ms. McLean recommended that the subcommittee consider: (1) what are the funding possibilities, (2) what is the attraction for obtaining a grant, and (3) what are the existing measures (e.g., CHF and stroke).

Dr. Jane Apson stated that she had worked in the community and is aware that diabetes is prevalent in Maryland and continuing to increase. Dr. Apson said that new information would catch the medical community's attention and ultimately help the people at risk. She suggested that the subcommittee share the behavior change model with Diane Becker before the next meeting.

John Ryan, M.D. stated he was an advocate for primary prevention. He said that hypertension was occurring and that if the disease was controlled, it would reduce stroke, CHD, CHF, and renal failure, among others.

Dr. Fisher agreed that the subcommittee should choose one primary and one secondary preventive measure. She said that people in the underserved areas do not know their blood

pressure or cholesterol levels. Screening should be available through church groups, shopping malls, schools, and health clubs on a regular basis. Dr. Fisher said there was a 10-15 year period when people do not go to the doctor. Pregnant women tend to receive medical care. Funding could occur through hospitals and drug companies.

Dr. Passamani asked what would happen if a person was diagnosed with a medical condition. Dr. Fisher suggested that the person would be referred to a primary physician or given a list of doctors or clinics.

Dr. Jerilyn Allen mentioned that hypercholsterolemia is not well controlled and should be added. Family history was also a risk factor. Ms. Frank said African Americans and Latinos receive information through churches. Wellness centers are more appropriate for African Americans. Ms. Frank said that we must build access to primary care and that there are many uninsured adults in Maryland. Exercise should be part of the school curriculum.

Ms. Jeanette Jenkins stated that there were health disparities and that gaps need to be closed. She said she was very sensitive to cost and is aware that funding will be limited. Ms. Jenkins suggested that a media partner could be a pilot in generating information about generic drugs.

Dr. Passamani said effectiveness and cost-effectiveness must be considered regarding the best practice. Dr. Dembo commented that the medical community is already aware of risk factors. Therefore, a pilot program is not needed to make the risk factors known. Instead, communication needs to be improved to address health care, cost, morbidity, and mortality.

Dr. Fisher said that many individuals do not take their medications correctly. Additionally, some people cannot afford medications so they fail to visit physicians.

Dr. Passamani stated the subcommittee members had provided good comments and suggested that they go around the table once more in case anyone had additional remarks. Dr. Kenigsberg said that doctors should address the cost-effective manner of generic drugs. According to Dr. Kenigsberg, use of generic drugs does not result in bad medical care.

Dr. Dembo stated that we spend much money for health care and that money is not always spent wisely. Dr. Passamani commented that if a patient has money and insurance coverage, he has access to excellent care.

Ms. McLean stated that we need to identify external sources of funding for these potential projects. The Commission does not have money available so there would be a need to identify additional sources of money. Ms. Frank said there is money in the health care system. She suggested a tax as an incentive.

Ms. Frank commented that we must consider what the barriers are in the system. One-on-one care with private physicians is very expensive. Other types of providers such as physician's assistants and nurse practitioners should be considered. There are many reasons why

it is difficult to obtain patient compliance. For example, regarding obesity, there seems to be something in our culture that leads to it. Additionally, there is availability to food.

Dr. Passamani commented that no one had mentioned cigarette smoking as a primary factor relating to vascular disease. Ms. Apson said that education regarding the dangers of smoking cigarettes would have to occur in schools. Dr. Passamani asked about adding a higher tax to cigarettes. Dr. Fisher stated that cigarettes were already expensive and people continue to purchase them. Dr. Dembo agreed that education would have to begin early, for example, with third-graders. Dr. Passamani said that once individuals are addicted to cigarettes, it is difficult to stop smoking. Dr. Ryan commented that millions of dollars were already being spent on campaigns against cigarette smoking.

Ms. Apson stated that there is a disparity regarding educating individuals living in urban and rural communities.

Dr. Passamani then asked if the subcommittee members had any suggestions regarding speakers or topics for the next meeting. Dr. Dembo mentioned that a prediction for one part of the body, or a total body scan, might identify non-entity diseases.

Dr. Passamani said that, in a broader sense, a person might know about risk the day before that he or she has a heart attack. Dr. Dembo said the subcommittee should consider what is in the research stream and how things might change. Ms. Barclay commented that Jim Field of the Advisory Board is focusing on technology issues with respect to the future organization and delivery of care and that he might be willing to speak to the subcommittee on technology trends.

Dr. Moran stated that we already have a lot of data, for example, histograms for patients who are high risk. He also mention third-party payer "stop" letters. Dr. Moran said that the state could utilize this information to look at behaviors indirectly.

6. Review of Subcommittee Report Outline

Dr. Passamani then asked Ms. Barclay to discuss the draft outline of the Report of the Subcommittee on Long Term Issues. Ms. Barclay said that the outline was a method of getting the group to think about the scope and organization of the report that will be submitted to the Steering Committee. She said it was a working document and would be revised throughout the subcommittee meetings.

Dr. Passamani asked the subcommittee members to review the outline and submit their comments on how to improve it to Ms. Barclay within two weeks. He said the comments did not have to be long, and they could be handwritten. Then Dr. Passamani asked if the subcommittee should consider Maryland's rank compared to other states. Ms. Barclay advised that the Heart Association could provide this information. Dr. Dembo said the subcommittee should consider what it could do regarding the rationing of health care.

Ms. Jenkins commented that the subcommittee had mentioned Medicaid and hospitals. She wondered if funding from Medicaid should be considered before the subcommittee started

tinkering with other methods. Dr. Passamani suggested that the subcommittee listen to Diane Becker's presentation before reaching a decision.

Ms. Fisher said that Medicaid might not be the right system to consider. She stated that individuals with Medicaid already had access to medical care. The subcommittee should consider those individuals who are caught in-between having private insurance and those with Medicaid--individuals who have nothing.

7.   Future Meeting Schedule

In addition to providing comments on refining the outline, Dr. Passamani asked each member to consider the future steps that should be taken regarding the subcommittee's next meeting. He invited everyone to write him a note, in care of Ms. Barclay, responding to the format and issues that were discussed during tonight's meeting. Then Dr. Passamani thanked everyone for participating in the meeting.

8.   Other Business

There was no other business discussed by the Subcommittee.

9.   Adjournment

The meeting adjourned at 7:30 p.m.

CARDIOVASCULAR DISEASE MODEL

Criteria	Primary Conditions				Secondary Conditions		
	Cigarettes	HBP	Diabetes	Obesity	CHF	SD	Stroke
Common Disorder							
Effective Treatment Available							
Minority/Underutilization							
Evidence of Under Utilization of Treatment							
Easy to Find Patients w/Disorder							
Treatment Complex							
Treatment Costly							
Untreated Mortality							
Untreated Morbidity							
Programs in Place							
Prevention: Simple or Complex							

Summary of the Meeting of the Advisory Committee on Outcome Assessment in Cardiovascular Care Subcommittee on Long Term Issues

October 17, 2002
Conference Room 108-109, Metro Executive Building, 4201 Patterson Avenue, Baltimore, Maryland 21215

Committee Members Present

Eugene R. Passamani, M.D., Chairman
Jerilyn Allen, Ph.D.
Jane R. Apson, M.S.P.H., Ph.D.
Irene Buadoo, M.D.
Patricia Casals, R.N.
Sheila Druck, R.N., BSN
Stacey Fisher, M.D.
Ruth Maiorana
George Moran, M.D.
Lisa Myers, R.N., M.S.
Kenneth Rempher, R.N.
John M. Ryan, M.D.

Guest Speakers Present

Diane Bild, M.D., Medical Officer
Division of Epidemiology and Clinical
   Applications, National Heart, Lung, and
   Blood Institute

Commission Staff Present

Barbara G. McLean
Pamela W. Barclay
Dolores Sands
Bridget Glazebrook
Susan Panek
Debbie Rajca
Colleen Lates

Committee Members Absent

William Balke, M.D.
Donald H. Dembo, M.D.
Lynn Frank, F.A.C.H.E.
Aaron Kenigsberg, M.D.
Cheryl VanKuren

Members of the Public Present

Vanessa Purnell, MedStar Health

1.	**Call to Order**

Eugene Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:05 p.m.

2.	**Approval of Previous Minutes (July 25, 2002)**

The minutes of the previous meeting were approved as submitted.

3. Update on Advisory Committee Activities

Pamela W. Barclay provided an update on activities of the Steering Committee as well as other subcommittees. She advised that a joint meeting of the Steering Committee and the Quality Measurement and Data Reporting Subcommittee was held earlier in the month. During that meeting, William Nugent, M.D. of the Dartmouth-Hitchcock Medical Center presented information regarding the Northern New England Cardiovascular Disease Study Group. Ms. Barclay also stated that the Commission had been provided with an interim progress report at their October meeting. A copy of that report will be forwarded to all subcommittee members in the next few weeks. Another meeting of the Quality Measurement and Data Reporting Subcommittee is being scheduled at the present time.

During the most recent meeting of the Inter-Hospital Transport Subcommittee, presenters provided information regarding inter-hospital transport systems involving the Peninsula Regional Medical Center, MedStar , and Rural Metro. It was agreed that if better information was to be obtained, it would be necessary to standardize data. Ms. Barclay also informed the Subcommittee that the Interventional Cardiology Subcommittee had met on October 16, 2002. During that meeting, Thomas Aversano, M.D. provided a detailed presentation regarding the C-PORT project that provided an overview of the clinical trial phase and the on-going data registry. Dr. Aversano also provided his ideas about future state oversight of primary angioplasty in hospitals without on-site cardiac surgery services.

4. Review of Background Information and Follow-up Discussion on Focus Area Priorities

Dr. Passamani asked John Ryan, M.D. to discuss a series of handouts that he had prepared for Subcommittee members. Dr. Ryan described each of the charts (i.e., Income of Household by State and Stroke Mortality Rate by State) and said that overall, Maryland's figures were in the middle of those of other states.

Then Dr. Passamani suggested that each Subcommittee member consider the progress the Subcommittee had made to date. He asked those present to recall the presentations that were made a few weeks earlier by Drs. Edward Kasper and Thomas Aversano. Dr. Passamani asked each Subcommittee member to state his or her priorities regarding the final recommendations that should be considered.

According to Ms. Sheila Druck, the Subcommittee should focus on a primary condition and a long-term issue. If left with one single choice, Dr. Ryan would select hypertension as an important predictor of heart failure. If allowed two choices, he would include congestive heart failure. Dr. Jerilyn Allen said there are multiple risk factors (i.e., cholesterol with hypertension). Heart failure is the number one reason for hospitalization of the elderly. If Dr. Allen had two choices, she would also select congestive heart failure (CHF).

Dr. George Moran stated there is a problem with how information is presented. He said that ACE inhibitors must be considered and that patients must take the correct ACE inhibitors at

the right dose. He added that to begin policing could cost a lot of money. Dr. Moran agreed with Dr. Ryan's opinion. He also said that diabetes is worth two risk factors and that it is a major public health issue. There is also an epidemic of obesity that can lead to diabetes. According to Dr. Moran, diabetes leads to infarction, which ultimately leads to heart failure. While Dr. Moran said the MHCC model is not a bad idea, he believes that educating the public should be a high priority.

Dr. Jane Apson stated that there is bias toward primary prevention. She is concerned about the disparity in the geographic and socioeconomic areas in Maryland. Dr. Apson suggested that a program be developed for pharmaceuticals. She mentioned that her mother was in her 80's and did not want to be admitted to an institution. As Dr. Apson considers her mother's health, she believes that the focus should be on primary care physicians because CHF occurs too late.

This was the first meeting that Ms. Ruth Maiorana attended, but she stated that she supported what the previous Subcommittee members had said. She commented that there must be a combination of primary and secondary prevention. Ms. Patricia Casals also said she believed in primary and secondary conditions. She stated that primary prevention should focus on education for obesity. By doing so, diabetes and hypertension will be reduced. As far as secondary prevention, she liked the model grid and commented that there needed to be a balanced approach. She believes that education decreases length of stay and this ultimately reduces the workload of physicians.

As far as primary prevention, Ms. Lisa Myers had no preference. As for secondary prevention, she believes that sudden death should be the focus. Additionally, she said that CHF would have merit. Data should be collected that is specific to Maryland. Mr. Kenneth Rempher stated there is a greater focus on metabolic typing in diabetes. Studies already have been done and we do not want to reinvent the wheel.

Stacey Fisher, M.D. commented that there should be a primary and secondary focus. The primary focus should be metabolic syndrome awareness and obesity. This is a huge contributor to the secondary factor of sudden death. Defibrillators are important if they can be used. There should be education programs with one focus point from each group.

Ms. Myers stated that Chicago has implemented a public-access defibrillation program at all of its airports. Defibrillators are strategically located through airport terminals. They are also available at the Baltimore-Washington Airport. The Maryland Institute of Emergency Medical Services Systems (MIEMSS) provides the requirements for participation in its Automated External Defibrillators (AED) Program in its "Information and Application Packet." A business or organization that meets certain requirements may set up a program whereby someone suffering a cardiac arrest on the authorized facility's premises can receive treatment with an AED on-site by appropriately trained non-medical (lay) personnel before the arrival of emergency medical services personnel. Entities exempt from the AED Program include healthcare facilities, federal government agencies, jurisdictional EMS operational programs, and commercial ambulance services. MIEMSS has an epidemiology department that is capable of collecting data regarding locations where heart attacks are occurring. (The home is actually the primary place

where heart attacks occur.) Public awareness of the AED Program is growing, but it needs to reach more people. A report regarding the progress of the AED Program will be submitted to the General Assembly shortly.

According to Ms. Myers, there will be long-term follow-up regarding patients who utilized AEDs. Additionally, public service announcements will occur. It is important to get the physicians involved in the program because facilities need direction. Police departments often get to the scene of a cardiac victim before the Emergency Medical Service (EMS) technicians arrive. A rural grant has also been awarded. Nine jurisdictions in Maryland were designated as rural with a little under $200,000 allotted for AEDs in those communities. EMS will provide the training that will begin by August 31, 2003.

Dr. Apson mentioned that perhaps EMS personnel could be trained to teach lay people on the use of AEDs. Dr. Passamani asked if there was a recommendation that the Subcommittee could make to place AEDs appropriately across the state of Maryland. Ms. Myers stated that in order to do so, data collection should continue and physician involvement should occur. Dr. Passamani suggested that the MHCC should consider getting a legal opinion to clarify some issues. Ms. Myers agreed and said that some insurance providers may not understand state law.

Dr. Moran suggested that it would easier to recruit physicians if a "toolkit" was in place, and if liability issues were clarified. Ms. Myers advised that she had a list of 10 or 12 physicians who would be willing to participate in the AED program. Dr. Passamani commented that communication was a major problem. He referred to a recent *New England Journal of Medicine* paper that reported AED's had successfully resuscitated approximately 10 of 18 people at Chicago airports.

5.   Presentation: Detection of Sub-Clinical Coronary Artery Disease

Dr. Passamani introduced Diane Bild, M.D., MPH, Medical Officer in the Division of Epidemiology and Clinical Applications at the National Heart, Lung, and Blood Institute.   Dr. Bild stated that the Multi-Ethnic Study of Atherosclerosis (MESA) study had been launched five years ago and involved examining a variety of technologies, including coronary calcium, cardiac MRI, carotid MRI, carotid ultrasound, ECG, arterial wave forms, endothelial function, and ankle-brachial index.   Until recently, there had been a "traditional" approach regarding coronary risk assessment, but this has moved toward a more "tiered" approach. Both the American Heart Association (AHA) and the National Cholesterol Education Program (NCEP) recommend more aggressive treatment. However, more information is needed about technologies. Dr. Bild described the NCEP ATP III – 3 Levels of Risk which included: (1) Zero to one risk factor, (2) 2+ risk factors, and (3) CHD and CHD risk equivalents[45].

According to Dr. Bild, there are various types of technologies to detect subclinical atherosclerosis.   For example, the electrocardiogram (EKG) has been available for over 100 years.   While carotid ultrasound is an easily performed procedure, standardization can be difficult. Dr. Bild stated that Ankle/Brachial BP Index was almost ready for "prime time." Endothelial function testing, while an early indicator of subclinical atherosclerosis, is not yet

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[45] Risk equivalents include diabetes, peripheral vascular disease, AAA, and symptomatic carotid artery disease.

ready to be utilized on a full-scale basis. EBCT (Electron Beam Computed Tomography)/Cardiac Multi-Slice Computed Tomography (MCT) is on the horizon for use, but more data is needed. Cardiac MRI (stress test with injection) is very expensive. Carotid MRI is capable of examining characteristics of plaque and can be done with or without contrast.

Calcium has been evident on x-rays for years and is a specific marker of atherosclerosis. In the 1980s, an EBCT scan was used, however, since the late 1990s, General Electric (GE) and Siemens have produced multi-detector scanners. Virtually identical results are obtained with both technologies. Additionally, if one scans them more than once, measurements are reproducible. The brightness of calcium is also measurable. The Agatston score demonstrates 40 sections of the heart. Prevalence of coronary calcium in an asymptomatic population shows there is an increase with age. Prevalence is also higher in the male population. The African American race shows coronary calcium rates are much lower than in other races.

The possible clinical values of CAC measurement are: (1) identify high-risk individuals requiring more intensive intervention or diagnostic investigation, (2) rule out (almost) CHD as a cause of chest pain, (3) monitor CAC to follow effects of therapy, and (4) inhibit or encourage calcification. According to Dr. Bild, there is much we do not understand such as, "Is calcium just an "innocent bystander?" She said it might stabilize or destabilize the plaque and we need to determine calcium's role. Dr. Bild stated that it is necessary to monitor the results to understand where the measures fit.

Dr. Passamani asked Dr. Bild if she had any sense of when answers would be available regarding risk assessment. Dr. Bild replied that it would be a few years before the results would be available.

Dr. Apson questioned whether there was a correlation between dietary calcium and coronary calcium. Dr. Bild noted the complex physiology governing serum calcium concentrations and thinks it unlikely that there would be a relationship between dietary calcium and coronary calcium.

6.   Future Meeting Schedule

Dr. Passamani asked Pam Barclay to advise the Subcommittee of the schedule of future meetings. She stated that dates were not yet finalized, but plans were underway to schedule a Subcommittee on Long Term Issues meeting in November and December. And, if necessary, a meeting could be scheduled for sometime in the early part of 2003. Although it was originally anticipated that the Subcommittees would present their reports to the Steering Committee by January 2003, Drs. Donald E. Wilson and James Scheuer agree that more time is needed in order to provide fully developed reports. Therefore, the Steering Committee will not be presenting the finalized report to the Commission until later in the next calendar year.

Regarding matters specific to the Subcommittee on Long Term Issues, it is hoped that Diane Becker, Sc.D., M.P.H., Professor of Medicine, Director, Johns Hopkins Center for Health Promotion, will be available to speak at the November meeting. Dr. Becker was scheduled to make a presentation at the July 25th meeting, but was unable to do so. Ms. Barclay also

mentioned that it was time to start drafting portions of the Subcommittee Report. She pointed out that the information Dr. Ryan presented regarding heart disease in Maryland would be helpful to all of the subcommittees as well as the Steering Committee

Dr. Apson asked if Dr. Becker could talk about primary prevention in general, specifically what has been successful. Dr. Moran suggested keeping a "side list" of items that do not require funding, such as the AED program. This list could be provided to the Commissioners along with the items that required funding. He also asked if the MHCC had a link with the Maryland Insurance Commission. Ms. Barbara McLean replied that there was regular communication between the two agencies.

Ms. Casals asked if Ms. Myers could obtain physician regulations. Ms. Myers advised that regulations were included in the back of the AED packet. Dr. Moran suggested that physicians should be informed of the time commitment that would be involved. Dr. Passamani agreed and said that in order to get physicians involved, it was necessary to drive out the unknown. Dr. Apson suggested that physicians be advised of their role, the risks that are involved, and the legal protection they would receive.

7.   Other Business

There was no other business.

8.   Adjournment

The meeting adjourned at 7:30 p.m.

Summary of the Meeting of the Advisory Committee on
Outcome Assessment in Cardiovascular Care
Subcommittee on Long Term Issues

November 20, 2002
Maryland Health Care Commission
4160 Patterson Avenue, Baltimore, Maryland 21215

Committee Members Present   **Commission Staff Present**
Eugene R. Passamani, M.D., Chairman   Barbara G. McLean
Jane R. Apson, M.S.P.H., Ph.D.[46]   Pamela W. Barclay
Donald H. Dembo, M.D.   Dolores Sands
Sheila Druck, R.N., BSN   Bridget Glazebrook
Lisa Myers, R.N., M.S.   Susan Panek
Kenneth Rempher, R.N.   Debbie Rajca
John M. Ryan, M.D.   Valerie McRae
Cheryl VanKuren

Committee Members Absent
Jerilyn Allen, Ph.D.
William Balke, M.D.
Irene Buadoo, M.D.
Patricia Casals
Stacey Fisher, M.D.
Aaron Kenigsberg, M.D.
Ruth Maiorana
George Moran, M.D.

1. Call to Order and Introductions

Eugene R. Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:10 p.m.

2. Approval of Previous Minutes (October 17, 2002)

Dr. Passamani asked if anyone wanted to modify the minutes of the last Subcommittee meeting. Ms. Lisa Myers requested a change on Page 4 to reflect, "EMS will provide the training that will begin January 31, 2003." Dr. Jane Apson requested that the second paragraph on Page 2 be changed to read, "Dr. Jane Apson has a bias….." Hearing no other changes, Dr. Passamani entertained a motion to approve the minutes of the Subcommittee's October 17, 2002 meeting as amended. Donald H. Dembo, M.D. moved approval, Ms. Cheryl VanKuren seconded his motion, and the members voted to approve the minutes.

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[46] Via Telephone Conference Call

3. Overview and Background

Dr. Passamani asked Ms. Pamela Barclay, Deputy Director, Health Resources, MHCC, to provide a preview of upcoming subcommittee meetings. Ms. Barclay reported that the Cardiac Surgery Data Workgroup of the Quality Measurement and Data Reporting Subcommittee would meet on Tuesday, November 26, 2002. It is expected that the Subcommittee members will finalize their recommendation on that date. The Quality Measurement and Data Reporting Subcommittee of the Advisory Committee on Outcome Assessment in Cardiovascular Care will meet on Wednesday, December 11, 2002. The Subcommittee on Long Term Issues is scheduled to meet again on December 12, 2002. The next meeting of the Steering Committee of the Advisory Committee on Outcome Assessment in Cardiovascular Care will be held on Tuesday, December 17, 2002. A tentative date of December 23, 2002 has been set for the next meeting of the Interventional Cardiology Subcommittee.

4. Presentation: Hospital Performance Evaluation Guide

Dr. Passamani asked Ms. Barbara McLean, Executive Director, MHCC, to provide the members of the Subcommittee with an overview of the Hospital Performance Evaluation Guide. A handout (attached) was provided to each member of the Subcommittee that described the history of the guide, as well as a tentative timeline for guide development in the future and the names of the members of the Report Card Steering Committee.   Ms. McLean advised that CMS had designated Maryland as the lead state for developing a hospital performance guide as part of a pilot program for national reporting similar to the recent nursing home pilot project. She said it is Maryland's goal to use the report card to facilitate continuous quality improvement. Currently, MHCC reports on its own website descriptive measures comparing LOS, discharges, and readmission rates based on the HSCRC data set. Ms. McLean also described the various features of the website design. Thirty-six DRGs are represented on the guide and a minimum of 20 cases is required for inclusion. Data from District of Columbia hospitals has also been included in the most recent version of the guide to more accurately calculate readmissions. The next phase of the hospital performance evaluation guide will focus on two JCAHO measurement sets which are community acquired pneumonia and congestive heart failure. These are sets of measures indicating whether the appropriate process of care was followed. A future step will be to include an obstetrics module because patients tend to shop for this type of medical service.

Dr. Passamani noted that there are errors in medicine and patients and families need to have more access to information about them. Providers also need these data to emulate the good providers. The Subcommittee should support quality measurement because it will encourage quality improvement. Dr. Dembo said there is historically experience with a report card because the Attorney General previously issued information on costs. That report card, however, did not deal with all of the issues, such as what to do about under-performers—to encourage improvement. He said that people are under the impression that under performing doctors will leave if errors are pointed out, but that does not actually happen. Although we have to be prepared for negative feelings regarding the report card approach, Dr. Dembo noted that it was important to recognize the positive aspects of reporting quality indicator data. Report cards can be issued internally for quality improvement and accountability or externally for consumers. It

may be that some information is more appropriately kept private while more conservative measures are made public.

5. Review and Discussion of Subcommittee Report Outline and Preliminary Recommendations

Dr. Passamani then asked Ms. Barclay to describe the structure of the upcoming report that the Subcommittee is to present to the Steering Committee. Ms. Barclay reviewed a suggested Table of Contents and preliminary list of recommendations for discussion by subcommittee members. The preliminary Table of Contents consisted of four components: I) Introduction, II) Overview Regarding Heart Disease in Maryland, III) Focus Areas, and IV) the Subcommittee Recommendations. Section II would focus on data that was presented by Dr. Ryan and Jeanette Jenkins. Section III would organize the subcommittee's discussions to include four principal areas, including Cardiovascular Health Status, Access to Care, Health Systems Organization and Research Agenda.

Dr. Passamani asked for comments from the Subcommittee members. Dr. Dembo stated process improvement is a moving target, but we can identify current problems and prioritize the issues that need to be addressed. He was not sure whether the Subcommittee should select one topic because there are a number of issues that need to be considered. He said enough is still not being done regarding secondary prevention and mentioned that the community at large needed to be educated regarding resuscitation. The Subcommittee should rank the prevention topics by importance, determine what we can and cannot do, and look to partner with those who can help us.

Mr. Kenneth Rempher stated that diabetes should be included in the subcommittee analysis and recommendations. Dr. Passamani agreed and said that diabetes tied into the early detection of sub-clinical coronary artery disease that Diane Bild, M.D. discussed during a previous Subcommittee meeting. He said it is difficult to talk healthy people into getting help. With better diagnostic devices and with the application of the burgeoning area of genetics, people will know their risk and that will help. Dr. Dembo said we need to get to it before heart failure occurs.

Dr. Apson identified three topics for subcommittee consideration: 1) access to care in rural vs. urban areas of the state; 2) approaches for containing costs for pharmaceutical drugs as an access issue; and 3) health status vs. secondary and tertiary level approaches. She noted that while resuscitation should be considered under tertiary approaches, diabetes control would be a primary prevention approach.

Dr. Passamani noted the epidemic of obesity in Maryland. He asked Ms. Barclay if the Subcommittee had access to obesity rates. Ms. Barclay replied that the Commission and Healthy People 2010 Project had data on the subject of obesity. Dr. Passamani suggested including that type of data in the overview section of the subcommittee's report. Ms. VanKuren stated that cost was a barrier to the program that should be under access to care. She said hypertension was another important area to consider in developing the subcommittee's recommendations.

Referring to the document containing draft subcommittee recommendations, Mr. Rempher asked if the suggestion to establish an annual award referred to a hospital program or community program. Ms. Barclay replied that the recommendation could refer to both. She noted that the subcommittee discussions had highlighted the good work being done by existing programs and the need to promote those programs and public awareness. Dr. Passamani commented that the American Heart Association would be a logical partner for this activity. Mr. Rempher said the subcommittee's recommendations should address the metabolic syndrome. Dr. Passamani stated there is a need to recognize and disseminate information about new risk factors for cardiovascular disease in general.

Mr. Rempher suggested that diabetes should be included under primary and secondary prevention. Ms. Sheila Druck said other risk factors such as smoking should also be added to the discussion. Dr. Dembo stated that issue of access to care by African Americans merited further study by the subcommittee. He noted that Med-Chi and the Monumental City Medical Society are collaborating on an effort to examine issues related to access to care by minorities.

Ms. Myers said all first responders should have automated external defibrillators (AEDs). Dr. Passamani said we need what is currently available and determine our goal with respect to increasing access to this technology. Ms. Myers said the American Heart Association (AHA) should be a partner with respect to the recommendation to increase use of AEDs in Maryland. Ms. Barclay asked about the potential use of home defibrillators recently approved by the Food and Drug Administration. Several subcommittee members suggested that a project to further evaluate the use of home defibrillators should be explored.

Ms. VanKuren suggested an addendum recommendation to include community cardiac rehabilitation programs. Dr. Passamani noted the importance of cardiac rehabilitation and the fact that frequently the service is not utilized to its full potential. Ms. VanKuren pointed out that the barriers to cardiac rehabilitation programs, such as insurance and transportation, frequently limit utilization. She also noted the knowledge is frequently not enough because you have to get people to change their behavior with exercise, diet/nutrition, and behavior modification. The focus should be to educate people today in order to promote long-term prevention. Awareness has to come from making changes today.

Dr. Ryan stated that the more narrow the focus, the better chance of accomplishment, He suggested starting with hypertension and, if we get it right, we can add other risk factors. Dr. Ryan mentioned that Med Chi and the State Advisory Council on Heart Disease and Stroke should be included as partners. Dr. Passamani asked if stroke should be included. Dr. Dembo agreed that consideration should be given to including stroke in the subcommittee's recommendations.

Dr. Apson said tobacco efforts are important. She said the pharmaceutical issue is just as important because it is important to encourage the use of less expensive medications. Dr. Dembo agreed with Dr. Apson and said patients with diabetes, and patients with hypertension, do not always receive treatment because of the prohibitive cost of drugs.

Subcommittee members also suggested that Recommendation 1 be reworded to state "….of the importance of *controlling* high blood pressure" rather than "of the importance of *treating* high blood pressure." Recommendation 3 should be changed to read "Increase the use of *the number of persons with access to* external defibrillators to treat sudden, out-of-hospital cardiac arrest."

Dr. Passamani asked staff to revise the recommendations based on the subcommittee discussion.

6. Other Business

There was no other business discussed by the subcommittee.

7. Adjournment

The meeting adjourned at 7:20 p.m.

**Summary of the Meeting of the Advisory Committee on Outcome
Assessment in Cardiovascular Care
Subcommittee on Long Term Issues**

**December 12, 2002
4160 Patterson Avenue, Baltimore, Maryland 21215**

Committee Members Present
Eugene R. Passamani, M.D., Chairman
Jane R. Apson, M.S.P.H., Ph.D.*
Patricia Casals*
Sheila Druck, R.N., BSN
Stacey Fisher, M.D.
Mark D. Kelemen, M.D.
Ruth Maiorana
George Moran, M.D.

Committee Members Absent
Jerilyn Allen, Ph.D.
William Balke, M.D.
Irene Buadoo, M.D.
Donald H. Dembo, M.D.
Lynn Frank, F.A.C.H.E.
Aaron Kenigsberg, M.D.
Lisa Myers, R.MN., M.S.
Kenneth Rempher, R.N.
John M. Ryan, M.D.
Cheryl VanKuren

Members of the Public Present
Vanessa Purnell, MedStar

Guest Speaker Present
Diane Becker, ScD, M.P.H.
   Professor of Medicine
   Director, Johns Hopkins Center for Health
   Promotion

Commission Staff Present
Barbara G. McLean
Pamela W. Barclay
Dolores Sands
Bridget Glazebrook
Susan Panek
Debbie Rajca
Valerie McRae

*Via Telephone Conference Call

1. Call to Order and Introductions

Eugene R. Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:10 p.m.

2. Approval of Previous Minutes (November 20, 2002)

The minutes of the Subcommittee's November 20, 2002 meeting were approved as presented.

3. Discussion of Potential Focus Areas for Developing Recommendations to the Steering Committee

Dr. Passamani reviewed the purpose and goals of the Subcommittee and the strategies that could be considered for improving the health and life expectancy for persons with heart

disease. He said that the Subcommittee had made much progress during previous meetings. He suggested the following five focus areas for developing recommendations for presentation to the December 17, 2002 Steering Committee meeting:

- Improve Access to Care for Underserved Populations
- Risk Factor Awareness
- Congestive Heart Failure
- Automated External Defibrillators
- Error in Medicine: Under Treatment, Over Treatment, and Misuse

Although Dr. Passamani commented that the Subcommittee had already discussed many of these focus areas, he said he planned to have Dr. Tom Nolan present information about health care process improvement strategies during a future meeting. Dr. Nolan is an expert in process improvement who works with the Institute for Health Care Improvement in Boston.

Dr. Passamani reviewed the Subcommittee charge and the topics had been discussed to date. He noted that Drs. Edward Kasper and Thomas Aversano had presented information regarding congestive heart failure (CHF) that suggested that CHF was costly, leads to poor quality of life, and poor survival. He asked if he should present this to the Steering Committee as a high priority, a moderate priority, or a low priority. He said he felt this was an important and growing problem. If patients leave the hospital and stop taking necessary medication, they frequently return to the hospital.

Dr. Moran agreed that CHF was an extremely important problem. He said compliance is a major issue, as well as the complexity of the treatment and the cost of that treatment. Dr. Moran commented that he was not convinced that the case management model that had been examined by a number of HMO-type organizations was the solution. He said some of these models had a local project value, but he believed the Subcommittee should look at the problem from a more global perspective. He said that DRG-127 is very expensive for the federal government and state government in part because medications are costly. Dr. Moran suggested this might be a place where some new model can be examined where the cost of the hospitalization gets extended into the outpatient therapy. With kidney disease patients, he noted the need for renal dialysis triggers the availability of more comprehensive coverage under the Medicare program. He said the Subcommittee should look at whether it is possible to define a low cost medication package for heart failure patients that gets tagged on to the hospitalization, but prevents the next hospitalization.

Dr. Passamani noted that CMS has a stake in improving the treatment of this disorder. CHF costs a lot of money to treat and it also destroys the quality of life. Dr. Passamani said he believed Dr. Moran was saying that he was not opposed to studying it, but he would just like to know that it is not going to be a "town vs. gown fight" and Dr. Moran would like to be sure that it is a reasonable study.

Dr. Passamani noted that since CMS is in Maryland, they might be willing to fund something that is sensible. Unless the Subcommittee felt terribly strongly that he should not mention this to the Steering Committee, he was going to say there is a coming epidemic of heart

failure that merits future study. Dr. Passamani stated that we seem to do a pretty good job in the hospital with heart failure, but when patients leave the hospital, we have trouble because they fall off regimen, or cannot afford regimen, and they are back in the hospital with poor quality of life as well.

Ms. Barbara McLean said since Maryland is one of the pilot states for the CMS hospital report card there may be some opportunities for coordinating an outpatient component on heart failure. She said she would have to investigate that, as well as the possibility of getting support from Delmarva to fund this type of effort.

4. Presentation: Building a Gateway to a Partnership in Health Research in African American Communities

Dr. Passamani then introduced Dr. Diane Becker. Dr. Becker, a distinguished investigator who has spent her life studying access to care in minorities, is a Professor of Medicine at Johns Hopkins Center for Health Promotion. Dr. Becker advised that she was going to present information on partnerships Johns Hopkins Hospital worked on with funding from both Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH) to evaluate strategies to improve the cardiovascular health status of the African American community.

Dr. Becker advised that while coronary heart disease rates are declining in both whites and blacks, with respect to prevalence, they are not declining in the same proportions, and neither are the death rates. Incidence rates suggest they are staying the same. In some groups, particularly urban African American women, the rates of coronary disease are actually increasing, but there is very poor data to support this. Of all of the population subgroups, the prevalence of coronary heart disease is highest in African American women, even though death rates are higher for African American males. Heart, Body, and Soul, Inc. was the parent of all the collaborative research and goes back to about 1986. It was a partnership originally of about 57 churches and grew ultimately to about 750 churches in Baltimore and an array of different groups including Johns Hopkins School of Medicine, the University of Maryland, and some aspects of the former Liberty Medical Center. The partnership is between experts in medical care, health care, research, and experts in community--the strongest leadership within the African American church, although there are others involved. Dr. Becker said she would provide an example of what could come of this kind of partnership in terms of a study of how we could actually improve health status. We are looking for partnerships that would endure beyond the term of a grant.

Dr. Becker stated she would not be talking much about Project Joy, but said it was just published in Public Health Reports. It is a study of church-based, YMCA-based, and the City Department of Recreation and Parks-based way of getting African American women who are peri-menopausal and post-menopausal active and fit to reduce their risk factors. There are 600 women in the study. They demonstrated that compared to the control group, there was a marked reduction in blood pressure and a change in body mass--more muscle mass and less fat mass. What they found in the 600 women translated to an 18 percent reduction in stroke risk if you were to apply that to the population of African American women.

Heart, Body, and Soul was the partnership between the clergy and Johns Hopkins. It was founded in 1988. Dr. Becker pointed out a workbook by John McKnight, who Dr. Becker described as the "guru of community ownership models of care." She provided the Subcommittee with a copy of his workbook entitled, "Building Communities From the Inside Out." Heart, Body, and Soul does not run through the traditional bureaucratic organizations. Instead, this freestanding organization has the capacity to compete for funds of its own. Research and service go together and both the academic and community agendas are supported. Dr. Becker stated that working with the community is important. She equated it with the concept, "Give a man a fish and he'll eat for a day. Teach a man to fish and he'll eat for a lifetime."

Dr. Becker mentioned two earlier projects. The first, "Living in God's Healthy Temple--The Light Way Project," involved 700 churches in Baltimore City, men and women, and showed a marked reduction in cardiovascular risk factors. The second, "Project Bless," was a two-community study between Prince George's County and Baltimore. It involved banning outdoor advertising on smoking, sales to minors, and an array of other things. This project led to the ban on outdoor advertising and was just rescinded by the Supreme Court almost 10 years later. It also started Baltimore workplaces to be smoke-free through a regulatory mandate instead of a legislative mandate. The pastors and the leadership in the community did it all.

The first Chairman of the Board was Rev. Melvin Tuggle and Lowell Whitehurst was also involved. We insisted that every fraternal organization on the Homewood Campus take part in what was happening. The Clergy United for Renewal in East Baltimore (CURE) had a W.K Kellogg Foundation grant of $831,515, a School-based Outreach fund of $64,996, a Strauss Foundation Sight N Soul of $38,207, and State of Maryland-Neighborhood-based Prevention of $501,000--through the HSCRC. Dr. Becker advised that the entire undertaking started as an HSCRC project. Johns Hopkins also received research grants. The project demonstrated that when something is purely voluntary, it could pull in funds. Dr. Becker said you really do not have to rely solely on state dollars because money is available elsewhere.

"The African American Family Heart Study for Brothers, For Sisters" shows that in Baltimore City, coronary disease tends to occur at a very young age and it clusters in families as it does in other groups. Siblings with premature heart disease have a risk that is 2 to 12 times that of the general population, and there is every reason to think that is the same in African Americans. In Baltimore City, it appears to be a higher relative risk. Diagrams regarding diastolic blood pressure for females showed that in every age group, the prevalence of hypertension was higher. High HDL, which is not usually a problem in the African American community, is a problem in some families.

African Americans use preventive services very differently than their Caucasian counterparts independent of socioeconomic status. Data also suggests that access to appropriate culturally acceptable models of care delivery has been a major barrier to coronary disease prevention in African Americans. The objective of the study was to see if they could develop an effective model for taking care of the major risk factors in these high-risk African American families that would lead to a lower risk of coronary disease. Dr. Becker said they identified

people who were hospitalized in every Baltimore area hospital and found people less than 60 years of age with documented coronary disease. They asked for access to their healthy unaffected siblings and then they screened them. Unfortunately, the majority of them had serious risk factors. They were randomized to community preventive cardiology clinics, which operate differently from physician-run clinics, and were followed for one year. They had full screenings, including treadmill tests, and all of their screenings were free of charge. The recommendations were sent back by the nurse practitioner to the screenee, who thought they were healthy, and to the screenee's physician. When they were randomized in the community intervention, the nurse practitioner and a community health worker provided all care. They were only seen by the physician at base line when they were screened and one year later. The team of cardiologists did pharmacological and lifestyle management initially. They set up the plan for the person in about five minutes and it was in the hands of the nurse practitioner and the community health worker. Pharmacological care was done by the nurse practitioner using national guidelines. They did not have a formal protocol. Dr. Becker said it would be just the same as if the physician were making decisions.

The community site was set up by a board of community people from Heart, Body, and Soul and it did not look like a typical care site. Rather, it looked like somebody's apartment with a play area and access to exercise equipment. Appointments were flexible. Patients were told they were to be seen in about a month, but were not given a specific day. If they did not come to the facility, the community health worker called them. However, approximately 90 percent of the time, they came within a window. Appointments did not seem to work because of various reasons (i.e., people had jobs). The community health worker at the community site did lifestyle counseling aggressively. Local YMCA also participated free of charge. People were allowed to come out during the evening, or people were seen at home or at work sites. Dr. Becker said, contrary to what you would think, this was not expensive. There were monthly meetings to review the cases with any one of the physicians and dialog was maintained throughout the care with the primary care provider. There was extensive nutrition counseling. The community health worker had lost 100 pounds. She was very fit and taught water aerobics for them and this was an extremely important part of her acceptance. They used a different diet than what is usually used that went aggressively after carbohydrates. Exercise equipment was provided. Blood pressure management was aggressive and it used national guidelines. They learned very quickly that you get one chance to control blood pressure. If you pick a high side effect profile, you won't see the patient again or the patient will not comply. If they had to add a second drug, combination therapy was much better accepted than taking two pills, which seemed like going backwards to people. Lipid management was done traditionally using ATP II Guidelines. In the African American community, there is very poor acceptance of statins. A large portion of that fear comes from the television advertising campaign, which even though there were African Americans in the television advertising campaign, they didn't look like people felt they should in the community, and people were frightened of the drug because of liver toxicity. When they got people on statins to control hyperlipidemia among the African American population, they were twice as likely to develop active myocitis with CPK elevations. They were only able to get about 50 percent of the people on statins.

The community health worker did smoking cessation management with nicotine replacement. Usual care was done exactly the same way in terms of making the

recommendations. The YMCA was available to the primary care provider and pharmacy cards and indigent protocol forms were provided to that provider. Maryland Medical Assistance and Pharmacy Assistance were used whenever possible. Both groups could use pharmacy cards that were provided free of charge to get their drugs for no charge. The groups were approximately similar in age and education. They were slightly better educated in the usual care group and had slightly lower blood pressure.

The one-year changes showed an almost 10 mm reduction in systolic blood pressure. Diastolic was different, HDL was no different. LDL was markedly different between the two groups. There was a decrement in glucose. There was less fat and better muscle mass. A marked difference between the two groups was seen regarding percent of blood pressure under control after one year. Regarding stopping smoking, community preventive cardiology was much better. Seventy-three percent of the people completed follow up even though there was a 90 percent participation rate because people who did not make changes did not want to come back to be evaluated.

In summary, the clinic had a significant impact. They are sensitive to how people want their care provided. They prefer not to have a physician. It was a real world model and it really worked. The cost of care per person was about one-third in the community clinic. It was more effective and cheaper. Dr. Becker said she has just been funded by the NIH to do a five-year follow up of this to see if people sustained the change. She said people were very receptive to this study. The partnership worked because they were not just advisors, they were involved in everything that was done. It is something that is possible to do. They are not traditional clinics. They have a marked impact on risk in African American communities.

Dr. Passamani asked Subcommittee members if they had any questions for Dr. Becker. He started the discussion by asking if the community clinic had all African American staff. Dr. Becker replied that the community health worker was African American and the nurse practitioner was not. There were two Caucasian physicians and one African American physician. Race seemed to make no difference whatsoever, except at the community health worker level, since she will go out and exercise with patients in the pool or will go to their homes. Patients were more comfortable when our community health worker came to their home than when the nurse practitioner came by herself.

Dr. Passamani asked Dr. Becker if she could recommend one initiative for this Committee on quality of cardiovascular care in Maryland, what would it be? He added that this Committee is charged with recommending to the state means whereby quality, access, and cost effectiveness can be increased and one of the big access components has to do with the errors in medicine. Dr. Becker said that if she were allowed to do anything, one of the most effective things one could do would be to develop a community based model of medical care. She said a community care site would be an incredibly potent way of providing care. Dr. Becker also said she believes the care is best provided by a nurse practitioner for both cost reasons, and the way a nurse practitioner can relate to patients.

Dr. Passamani paraphrased by saying you need a community-based means to identify some sector of this underserved population that are at quite high risk, and then have that attached

to some type of approach to deliver care to those people. Dr. Passamani said he thought of prevention as concentric circles. The center of the circle are those at high risk and that is where the action is and as you go out further and further, you have less bang for that buck because you are dealing with less and less risk. Dr. Becker agreed and said the McKnight Model would tell you that in the African American community that networking is very powerful. If you are dealing with a high-risk population, all of a sudden everybody else in the family who may not need the same intensity of care pays attention and comes. They serve as an entree into the rest of the family. They are generally very large families that care about their entire family, including the children. Dr. Becker said she thought the real trick was the point of entry.

Dr. Passamani asked about stroke. Dr. Becker said they concentrate on stroke, diabetes, and coronary disease. The risk behaviors, risk factors, and all of the inherited patterns are very similar so they teach stroke awareness and coronary disease awareness as part of everything they do.

Dr. Passamani questioned if the community recognized stroke for the awful thing that it is. Dr. Becker said that stroke is perceived as a really serious risk. However, the more familiar people are with the risk, and the more people survive some event and are stroke survivors, there is more acceptance that stroke is something that is not as noxious as having your first event be sudden cardiac death. There is almost a sense of comfort that should not be there. Dr. Passamani commented it is similar to myocardial infarction survivors who show up late for chest pain. Dr. Becker said she did not think there was very good awareness of stroke symptoms. Often, the African American population does not feel well since BMI is about 30, and a lot of the stroke symptoms are vague. Therefore, they may not always discriminate between something that is really serious and something not serious.

Dr. Passamani said the Subcommittee members had talked a great deal about the disconnect between the treatment of CHF in the hospital and then what happens when patients leave the hospital. He asked Dr. Becker if she could talk to the Subcommittee a little about CHF. Dr. Becker said this was an issue that was also accepted. For example, in Project Joy, they screened people extremely well before bringing them into an intensive exercise program. The average BMI was 35 and the highest BMI was 62. They also had their own primary care providers say this was okay in addition to the screening. Dr. Becker provided an example of a woman had been in the pool for two minutes and suffered pulmonary edema. The woman was 49, quite obese, and had not been able to sleep lying down for years. The whole scenario was there, and her daughter who lived with her was a registered nurse. People interpret the early signs of CHF often as something associated with being obese. Dr. Becker stated that they had a new NIH project on CHF, so she might have additional information to share in about two years.

Stacey Fisher, M.D. asked if the prescription drug cost was part of the extra costs regarding the cost analysis. Dr. Becker replied this was correct. She said they use prescription drug cost, the cost of the physician or the nurse's time and salary, actual space rental, and every single true cost independent of whether they paid that cost or not.

Dr. Passamani questioned if the church community worker model worked in rural and urban settings. Dr. Becker said she had not done that much church work outside of Baltimore

except for the smoking project, but she did partner with two other communities. One, outside Charlottesville, found the same results for blood pressure control. So far the other, the University of Alabama at Birmingham, has found the church is more influential because there are fewer of them and more people are involved in the church than in the community.

Dr. Jane Apson asked for clarification regarding familiarity with stroke. Dr. Becker stated that the more familiar people were with people who had survived strokes, the more likely they were to rate that as a lower risk or lower fear phenomenon.

6. Other Business

Dr. Passamani mentioned an editorial he had distributed by Tom Lee on the error in medicine topic that had been published on December 12th in The New England Journal of Medicine. He then asked the Subcommittee members if they were in agreement on the recommended five focus areas.

Dr. Passamani advised that he did not include the cost of medication in the recommendations because he felt it was just too large for the Subcommittee to consider, and it was too big of an issue for the state. Vaccination and general care for children were topics that were considered, but Dr. Passamani felt these issues were difficult for this particular Subcommittee to address in detail.

Dr. Fisher mentioned the analogy of the concentric circles. Dr. Passamani said the business of having concentric circles seems to him as one way of approaching this problem. That is, the center of the target are those who are truly at high risk and those who are farther out are those who have risk but not nearly as high. As you more further out, the cost effectiveness of the intervention drops dramatically because you are treating a lot of people who may not need it.

7. Adjournment

The meeting adjourned at 7:25 p.m.

**Summary of the Meeting of the Advisory Committee on
Outcome Assessment in Cardiovascular Care
Subcommittee on Long Term Issues**

**January 22, 2003
4160 Patterson Avenue, Baltimore, Maryland 21215**

Committee Members Present

Eugene R. Passamani, M.D., Chairman
Jane R. Apson, M.S.P.H., Ph.D.*
Donald H. Dembo, M.D.
Sheila Druck, R.N.
Mark Kelemen, M.D.
Ruth Maiorana
George Moran, M.D.
Lisa Myers, R.N., M.S.
Kenneth Rempher, R.N.

Committee Members Absent

Jerilyn Allen, Ph.D.
Irene Buadoo, M.D.
Patricia Casals
Stacey Fisher, M.D.
Aaron Kenigsberg, M.D.
John M. Ryan, M.D.
Cheryl VanKuren

*Via Telephone Conference Call

Members of the Public Present

Vanessa Purnell, MedStar
Michaeline R. Fedder, MA, American Heart
  Association

Guest Speaker Present

Thomas W. Nolan, Ph.D.,
  Statistician and Senior Fellow, Institute for
  Healthcare Improvement, Boston, MA

Commission Staff Present

Pamela W. Barclay
Dolores Sands
Bridget Glazebrook
Susan Panek
Debbie Rajca
Colleen Lates

1. Call to Order and Introductions

Eugene R. Passamani, M.D., Chairman of the Long Term Issues Subcommittee, called the meeting to order at 6:05 p.m.

2. Approval of Previous Minutes (December 12, 2002)

Dr. Passamani asked if anyone wanted to modify the minutes of the last Subcommittee meeting. Hearing no changes, Dr. Passamani asked for a motion to approve the minutes of the Subcommittee's December 12, 2002 meeting. Donald Dembo, M.D. moved approval, Ms. Sheila Druck seconded his motion, and the members voted to approve the minutes as presented.

3. Overview and Background

Passamani asked Ms. Pamela Barclay to update the Subcommittee on the activities of the other subcommittees and the Steering Committee. Ms. Barclay stated that the Subcommittee on

Quality Measurement and Data Reporting and the Subcommittee on Inter-Hospital Transport met earlier in January. The Subcommittee on Interventional Cardiology is scheduled to meet on January 27, 2003 and the Steering Committee is tentatively scheduled to meet on February 19, 2003. Attempts are being made to get the subcommittee's recommendations on the agenda for that meeting so the subcommittees can obtain some feedback from the Steering Committee. Then steps can be taken to integrate some of the things the four subcommittees have been discussing. Ms. Barclay advised that a copy of the *Interim Report* was sent to subcommittee members and minutes of all of the subcommittees were included in the report. Copies of the *Interim Report* are available to anyone who did not receive one.

Dr. Passamani advised the group that activities were coming to a close. He anticipates that he and Ms. Barclay will complete a draft of a report in early March that will be distributed to all of the subcommittee members so they may review and comment on the report. During the December 17, 2002 Steering Committee meeting, Passamani presented a summary of the subcommittee's activities focused on the following areas:

- Improve Access to Care for Underserved Populations
- Risk Factor Awareness
- Congestive Heart Failure
- Automated External Defibrillators
- Error in Medicine: Under Treatment, Over Treatment, and Misuse

Dr. Dembo mentioned that in addressing chronic heart failure, the implementation of biventricular pacing was just mentioned briefly in the minutes. He said devices are increasing outside of this area. Outside of this area, it is greater than one to one. Patients are not being hospitalized. Dr. Dembo felt this topic should not be omitted from the subcommittee's recommendations. Dr. Passamani said we had watched the development of this technology and now it is maturing. We probably have a couple of years of follow up on it. He said it is what Dr. Dembo pointed out two or three meetings ago--that technology does change our lives. Dr. Dembo also said that metabolic syndrome and obesity in children should be discussed. He commented that diabetes is mismanaged in this country. Dr. Passamani said the Subcommittee had spent a lot of time discussing metabolic syndrome and obesity, and he had placed those topics under risk factor awareness.

Dr. Passamani introduced a distinguished guest who attended the evening's meeting, Ms. Michaeline Fedder. Ms. Fedder is the newly appointed Chair of the Governor's Advisory Council on Heart Disease and Stroke. She is also a devoted, long-term member of the American Heart Association in Maryland.

4. Presentation: Process Improvement Issues: Current and Future

Dr. Passamani then introduced Dr. Thomas Nolan. Dr. Nolan is a statistician who works with the Institute of Healthcare Improvement (IHI) in Boston. Dr. Passamani advised that Nolan would be discussing the present state of process improvement and where it is likely to go in the future.

Dr. Nolan stated that while he was preparing his presentation, he noticed a recent article in Sunday's *New York Times* that outlined the improvements that have been made in the care of heart disease. He said there was an impressive graph over time that showed reduced death rates. The following issues raised by the article related to process improvement:

1. There was no one particular intervention, or even two or three interventions which resulted in this drop in mortality rate. It was a sequence of things in a very complex system over time that resulted in the change. Often researchers ask which of the things made the difference, but usually it is an interaction that contributes most to change.

2. Regarding mortality rates, Dr. Nolan said we should ask, "On average what about variation of hospitals in Maryland or in hospitals in Maryland vs. hospitals in California?" On average, we may be doing well, but there is variation regarding death rates from procedures or heart attack in the community. Variation is something to consider.

3. Some of the interventions that made a difference were generated through research studies. The question from a process improvement viewpoint is how quickly was the knowledge that was generated in the research studies put into actual practice? Dr. Nolan said it would be interesting to look at a graph like the one on the front page of the *New York Times* and ask, "Suppose that if the time between the research finding was cut in half, what would the curve look like?"

4. The article also mentioned some residual issues that arise from the improvement. For example, we are doing well with acute problems, but now we are left with some other problems, one of which is living with heart failure as a chronic condition. And, for older adults, how do we prepare people for end of life? They may not die of myocardial infarction, but will probably die of heart failure. Nolan said we are now left with a new set of quality issues that must be addressed. These new issues raise more problems that might be more difficult to solve. For example, it is probably harder to measure quality for treatment of a chronic condition or end of life care than mortality from a heart attack.

According to Dr. Nolan, we need some new systems of care--systems that are not so focused on the hospital, but are distributed in the whole community. The question in Maryland becomes if we need these new systems, how fast will we design them and how fast will we spread the knowledge either from research or practice in various parts of the state? Also, how consistent will care be across different providers? These are issues that collectively fall under the purview of process improvement.

Dr. Nolan defined process improvement as a combination of professional knowledge with knowledge of systems and variations in local settings of care. In process improvement, we are interested in measurement, but there are two different types of measures when people think about improving quality. Dr. Nolan said his colleague, Don Berwick, drew this conclusion when people were asking him about process improvement vs. reporting outcome.   Pathway 1 looks at

data on results. The purpose of that work is often for selection and accountability. We are looking for knowledge about performance and the key customers are consumers, purchasers, regulators, patients, contractors, and referring clinicians.
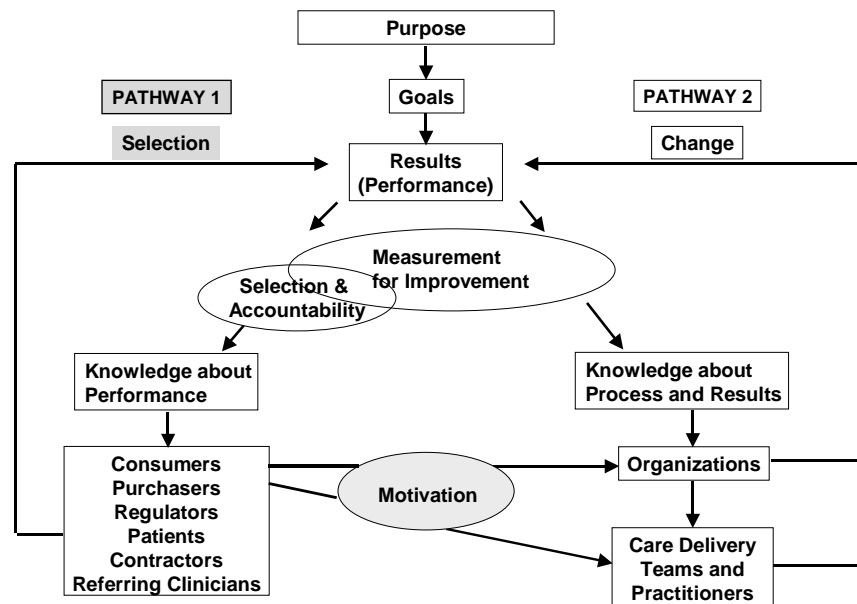
Strategic Framework Board

Pathway 2 is a complementary path of improvement work. Down that path, we look at the same measures, but we use them for improvement and our first step is to gain some knowledge about processes and results. What processes are actually driving those results? That knowledge is gained at levels of individual organizations and individual care delivery teams and practitioners.   The connection between them is that in the best case they work as a system. Under the measurement for judgment, the measures provide some motivation for people to make changes in systems that will be needed to change the results. Feeding back results provides motivation. It never improves anything unless changes are made.

Dr. Passamani gave an example that the state of New York reports coronary artery bypass graph mortality and, generally speaking, referring physicians and patients may not give much attention to that except that with the other pathway, low volume, low quality surgeons no longer practice. He said he believed it was actually both pathways that were working.

Dr. Nolan mentioned that last year at IHI, they had the pleasure of having Dr. Brian Jarman from the United Kingdom (U.K.) join them. Dr. Jarman is a general practitioner in England and a Ph.D. physicist who just became the head of the British Medical Association. He

is also an expert of the analysis of large databases. In the U.K. for the last ten years, Dr. Jarman has actually looked at what he calls hospital standardized mortality rates for various hospitals across the U.K. When he was in this country, he did the same thing using Medicare data for U.S. hospitals. Dr. Nolan discussed a graph that summarized a random 250-hospital sample that Dr. Jarman prepared. Because it showed variation in hospitals, Dr. Nolan said they had to ask 1) what is causing the variation, 2) can we learn something from it, and 3) how can we make improvements? Nolan described the following 2x2 Planning Matrix (Data from Six Hospitals) that was used for measuring ICU Admission and Comfort Care Only data:

	ICU Admission		
Comfort Care Only		Yes	No
	Yes	4.3% (0-14%)	21.3% (0-36%)
	No	37.8% (16-60%)	36.6% (18-62%)

He said they asked people to look at the last 50 deaths. Dr. Nolan stated that one of the suggestions was when patients enter the hospital, actually place them into one of the cells, understand what the risk factor is, and perhaps tailor the care to the risk using the data. As it turned out, they began learning something very important. And, as they did this with three or four hospitals, they began comparing notes and noticed some patterns regarding how and where people were dying. What was surprising was there were not more in Box 3 (37.8%). Even more interesting was Box 4 (36.6%). When they examined this area more closely, they noticed some interesting information such as: 1) places did not have house staff--the degree to which nurses when they feel like a patient is getting in trouble can get help from doctors, and 2) care of pneumonia in elderly patients.   Dr. Passamani commented that it was unanticipated death and Dr. Nolan agreed.

Dr. Nolan said the things in the fourth box are systemic and they are not particularly a diagnosis. The idea is taking the measure, mortality, which certainly if you fed it back to people you would get all sorts of controversy. They went to the next step and asked what is driving the mortality? What are some of the processes that one might examine?   Dr. Nolan said there are actually two areas of improvement methods. One is design and the other is replication. For example, if facilities do well in their treatment of heart attack victims, how do we replicate good systems of care?

Dr. Nolan then discussed Pathway 2, which is not so much design, but what is being practiced. At IHI, they have developed over the last four years an approach to collaborative improvement--that is, spreading systems of care. IHI has applied this approach to a variety of topics including coronary artery bypass surgery, diabetes, and safety. Their biggest project has involved England. England chose to spread care at the general practice level and it chose three topics: 1) access to care, 2) coronary heart disease, and 3) GP specialist interaction. There are 50 million people in England and 5 million in Maryland, so it is a 10-fold increase in the kind of spread we are trying to do here in Maryland. England reached about 30 million in two to three years. What are some of the methods? They started with core teams and worked with them for 12 months. At 6 months, the project managers ran local awareness events. All practice teams engaged supplied monthly data throughout. Dr. Nolan gave the following suggestion on how to spread on a large scale:

- PLAN FROM THE OUTSET;
- Communication from the outset to create awareness;
- Gain early support from national opinion leaders;
- Gain critical mass from the early work;
- Use participants to spread;
- Identify and cultivate "leaders";
- Align national or organizational policy to have a pull effect (i.e., create a demand); and
- BUT PLAN SPREAD FROM THE OUTSET

The study was a series of defining what good care looks like, presenting the evidence that it is already being done elsewhere, getting a few simple measures that are reported monthly so that you could compare yourself to others and learn from it, and then have a pretty well thought out system of how this system of care was going to spread. In summary, measurement, the improvement side, design, and replication are important in Maryland.

Dr. Dembo said in Maryland, the spread of concepts of ideas occurs in an environment in which physicians are very conservative. The taking on of new concepts and new procedures is slow. He has felt this is a manifestation of our failure to have a common source of standards. In Maryland, there is a system of "if we have not done it; we are not going to do it."

Dr. Passamani said one of the themes of good process improvement is communication. It is important to identify best practice and then spread it. He mentioned an article he had read in the *Wall Street Journal* about two weeks ago about Finland. He said when he entered cardiology, Finland was the leader in coronary mortality, but they have cut that down. He asked, "Wouldn't it be interesting to declare as a metric to measure our success in Maryland our position in the table of cardiovascular mortality in the 50 states?" He stated that we have heard from earlier discussions that Maryland is in the middle. Dr. Passamani asked, "Wouldn't it be interesting to declare as a goal in the next ten years to change our position through process improvement? The American Heart Association said that by 2010, they wanted to cut mortality by 25%. All of our discussions are rather formless unless there is that kind of vision of what we want to accomplish." We should look at data where Maryland sits and say, "We are now 25, we'd like to be 10."

Dr. Nolan stated there is quite a bit of literature on how things spread. It is difficult to break the fiefdom mentality. He said Dr. Passamani's point of goal is crucial because nobody improves unless they intend to change. Dr. Dembo commented that Dr. Nolan made a tremendous point. He said it is one thing for people to sit around a table and come up with a methodology, but in order to make this non-confrontational, an organization of process must be in place.

Dr. Passamani asked Dr. Nolan if he had guidance for the subcommittee on how it might sensibly focus this notion of identifying best practice and spreading it. How do you select topics? Dr. Nolan replied that Don Berwick often suggests topics, or people come to them and suggest topics. There is a gap between what is known and what is practiced. When there is a

large gap, that is a topic they would choose--if there was enough interest in it. The second thing they do is look for the physician or nurse leaders in that topic area because they are a great source of good practice. He commented, "We have a combination of the credibility from a national leader to the practitioners."

Dr. Passamani said the feedback to someone who engages in that is that shift in blood pressure control is every bit as important to that set of patients as discovering that blood pressure control is important. Mark Kelemen, M.D. asked about whether we can implement the type of system Dr. Nolan discusses within the framework of a research question. Dr. Kelemen raised the possibility of a statewide registry of patients with coronary artery disease who are doing well, asking the question "What component of secondary prevention diet, exercise, type of medications, and response to medications are related to living successfully with CAD?" He mentioned that, in addition to C-PORT, pharmaceutical companies have well established state-wide networks and experience with quality care databases.

Kenneth Rempher mentioned IHI and a discussion of best practice from a nursing perspective. He said they had developed a prototype of a clinical pathway that was based on ACC clinical guidelines and they have had great success with that process. Delmarva recognized that our numbers were impressive. One of the things they asked us to do was to share that process. We had a good experience and are still using it and having good results.

Dr. Passamani asked Dr. Nolan to comment on the migration of this in-hospital process improvement notion to the outpatient setting. Dr. Nolan said that some of the best work in the United States in terms of spreading good practice is in the Bureau of Primary Health Care. He suggested that the subcommittee contact David Stephens. According to Dr. Nolan, the Bureau has done tremendous work nationally with their neighborhood health centers that serve the underserved because they actually have a structure.

Ms. Barclay asked Dr. Nolan who championed this in England and how did it get identified as something to be done and off the ground organizationally? Nolan replied that the real driving force was Dr. John Oldham, a nationally known general practitioner in England. He came to the United States to see what was happening regarding improvement work, especially with regard to access. He was interested in primary care access. Dr. Oldham gathered information from the United States and put it in his practice in England. He took it on himself and tried to convince someone in England it should be done there. His goal was all of England. He talked to government officials and Tony Blair's reelection was up so there was a push from the top. He got funding for it--funding from the national government. It had a low budget with three or four staff.

Dr. Passamani asked if they measured information other than blood pressure. Dr. Nolan said yes, that access was another type of information and difference in mortality rates was also noticed. Dr. Passamani said it seems you have to measure a few things and not many things. Dr. Nolan agreed since people only have so much time and energy to devote to improvement. Dr. Dembo mentioned that the funding issue was something to consider, especially because the state is facing a budget deficit. He spoke of drug company support. Dr. Nolan said that CMS had done some collaborative work. In England, they declare a national aim. George Moran, M.D.

said we do not have the money to spend and asked how can government hurt things or be more effective?

Dr. Nolan said there are two approaches. The first is declaring the aim. The second would be to integrate the people who are already doing things. Mr. Rempher asked if that was not the role of Delmarva. Dr. Nolan suggested that the subcommittee could talk to David Stephens and ask, "Can you focus the community health centers on this?". Or, the subcommittee could contact the Veteran's Administration, who has done tremendous work in collaborative, and ask if they would participate.

Jane Apson stated that many hospitals in the rural community have primary care offices for support. Hospitals are all accredited and required to do performance improvement and select a set of measures. She asked, "Can we not, through State Health Plan, strongly urge one of those measures around a set of coronary heart disease indicators?" Dr. Passamani said that was a good idea.

6. Other Business

There was no other business discussed by the subcommittee.

7. Adjournment

The meeting adjourned at 7:15 p.m.

Appendix B.

Data Tables and Figures

Table B-1: Leading Causes of Death, Age-Adjusted Death Rates: Maryland Compared with United States, 2001.

Cause of Death	Maryland	United States
Diseases of the heart	251.6	247.8
All cancers	204.6	196.0
Stroke	59.6	57.9
Chronic obstructive pulmonary diseases	39.2	43.7
Diabetes mellitus	29.2	25.3
Unintentional injuries	25.7	35.7
Alzheimer's disease	20.2	19.1
Influenza and pneumonia	19.3	22.0
Nephritis and nephrosis	12.0	14.0
All Causes	881.4	854.5

Deaths per 100,000 population, age-adjusted to 2000 total U.S. population. ICD-10-CM codes.
Source: Arias E, Anderson RN, Hsiang-Ching K, Murphy SL, Kochanek KD. *Deaths: Final data for 2001.* National vital statistics reports; vol 52 no 3. Hyattsville, Maryland: National Center for Health Statistics. 2003. (http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_03.pdf)

Table B-2a: Age-Adjusted Death Rates per 100,000 Population for Diseases of the Heart, Maryland and the U.S., 1990-2001.

	Age-adjusted to the projected 2000 U.S. population*		Age-adjusted to the 1940 U.S. population†	
	United States	Maryland	United States	Maryland
1990	318.6	315.9	152.0	151.6
1991	310.7	302.8	148.2	145.6
1992	303.0	298.1	144.3	141.5
1993	306.8	298.2	144.7	142.1
1994	296.7	287.4	140.4	137.7
1995	293.3	277.9	138.3	132.6
1996	285.4	272.2	134.6	131.1
1997	277.6	266.8	130.5	127.5
1998	269.7	258.6	126.0	123.4
1999	267.8	258.5	-	-
2000	257.6	260.1	-	-
2001	247.7	254.5	-	-

*1. Age-adjusted to the projected 2000 U.S. population.

  2. Beginning with 1999 data, the tenth revision of the International Classification of Diseases (ICD) was used to code the causes of death reported on death certificates. ICD-10 replaced ICD-9, which was used with 1979-98 data. ICD-10 differs substantially from ICD-9. The National Center for Health Statistics has prepared preliminary comparability ratios for selected causes of death by double-coding a national sample of 1996 deaths using both ICD-9 and ICD-10 coding. These ratios were calculated by dividing the number of deaths attributed to a certain cause of death using ICD-10 coding by the number of deaths using ICD-9 coding. A ratio of 1.00 indicates that the same number of deaths was assigned to a particular cause of death using ICD-9 and ICD-10 coding. A ratio of less than 1.00 results from either a decline in the assignment of deaths to a cause in ICD-10 compared with ICD-9, or because a cause of death in ICD-10 is only a part of the ICD-9 revision title. The above data for years earlier than 1999, in order to compare trends, have been adjusted to the tenth revision by multiplying the rate as it existed using the ninth revision by the comparability ratios. (Comparability ratio for diseases of the heart: 0.9858; 95 % Confidence Interval 0.9854 - 0.9863.)

  3. Rates for 2001 are preliminary.

  Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001.*

†1. Age-adjusted to the 1940 U.S. population

  2. ICD-9-CM codes (390-398, 402, 404-429)

  Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 1998.*

Table B-2b: Age-Adjusted Death Rates per 100,000 Population for Diseases of the Heart by Race and Sex, Maryland, 1992-2001.

	Maryland				
	All Races	**White Males**	**Black Males**	**White Females**	**Black Females**
1992	298.1	380.3	424.2	231.2	263.6
1993	298.2	369.5	428.8	232.6	289.5
1994	287.4	352.0	407.3	223.4	272.4
1995	277.9	338.7	382.2	220.8	262.7
1996	272.2	338.5	389.2	209.1	266.7
1997	266.8	314.3	383.4	209.2	276.5
1998	258.6	308.1	381.7	201.3	266.6
1999	258.5	303.6	351.1	203.8	275.1
2000	260.1	305.3	376.1	207.5	261.4
2001	254.5	299.2	365.8	203.0	261.5

1. Age-adjusted to the projected 2000 U.S. population.

2. Beginning with 1999 data, the tenth revision of the International Classification of Diseases (ICD) was used to code the causes of death reported on death certificates. ICD-10 replaced ICD-9, which was used with 1979-98 data. ICD-10 differs substantially from ICD-9. The NCHS has prepared preliminary comparability ratios for selected causes of death by double-coding a national sample of 1996 deaths using both ICD-9 and ICD-10 coding. These ratios were calculated by dividing the number of deaths attributed to a certain cause of death using ICD-10 coding by the number of deaths using ICD-9 coding. A ratio of 1.00 indicates that the same number of deaths was assigned to a particular cause of death using ICD-9 and ICD-10 coding. A ratio of less than 1.00 results from either a decline in the assignment of deaths to a cause in ICD-10 compared with ICD-9, or because a cause of death in ICD-10 is only a part of the ICD-9 revision title. The above data for years earlier than 1999, in order to compare trends, have been adjusted to the tenth revision by multiplying the rate as it existed using the ninth revision by the comparability ratios. (Comparability ratio for diseases of the heart: 0.9858; 95 % Confidence Interval 0.9854 - 0.9863.)

3. Rates for 2001 are preliminary.

Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Division of Health Statistics, *Maryland Vital Statistics Annual Report, 2001*.

Figure B-1
Age-adjusted* Death Rate for Diseases of the Heart by Jurisidiction, 2001-2003

*Adjusted to the projected 2000 population by the direct method. These rates should only be compared with other rates age-adjusted to the projected 2000 population.
Source: Department of Health and Mental Hygiene, Vital Statistics Administration, Maryland Vital Statistics Annual Report, 2003.

B-3

Table B-3: Number of all cardiac deaths, proportion of sudden cardiac deaths (SCDs), age-adjusted and age-specific rates*, by reporting area — United States, 1999.

Area	All Cardiac Deaths	SCD			Age-Specific SCD rates					
			Age-Adjusted		0-34 yrs		35-64 yrs		≥ 65 yrs	
		%	No.	Rate†	No.	Rate†	No.	Rate†	No.	Rate†
Alabama	13,489	62.9	8,481	194.1	113	5.3	1,821	108.3	6,547	1,152.7
Alaska	571	67.3	384	126.9	6	—§	142	58.0	236	679.1
Arizona	10,870	66.1	7,187	154.8	48	2.0	1,076	62.3	6,062	964.3
Arkansas	8,358	57.5	4,808	171.9	58	4.7	894	94.0	3,855	1,066.9
California	72,360	64.8	46,859	164.8	375	2.2	7,364	60.7	39,115	1,072.4
Colorado	6,476	71.3	4,615	140.1	61	3.1	809	48.6	3,745	918.4
Connecticut	9,169	70.5	6,463	170.0	37	2.4	864	67.3	5,562	1,187.0
Delaware	2,020	66.1	1,336	185.3	16	—	218	75.0	1,102	1,122.9
District of Columbia	1,661	65.7	1,091	191.3	10	—	223	105.7	857	1,188.6
Florida	51,608	60.5	31,243	155.0	208	3.1	4,381	77.1	26,648	971.9
Georgia	17,713	63.4	11,224	182.7	169	4.2	2,735	91.4	8,320	1,093.1
Hawaii	2,420	57.2	1,383	114.6	16	—	303	64.8	1,064	657.2
Idaho	2,558	72.2	1,847	160.3	17	—	277	60.1	1,553	1,093.4
Illinois	33,561	65.4	21,924	182.2	245	4.1	3,997	86.8	17,682	1,181.8
Indiana	16,750	61.3	10,272	175.3	106	3.6	1,759	77.5	8,407	1,131.5
Iowa	8,724	66.1	5,768	160.3	26	1.9	735	67.9	5,007	1,168.5
Kansas	7,013	61.8	4,335	146.9	24	1.8	591	59.7	3,720	1,050.6
Kentucky	12,162	58.4	7,103	184.1	73	3.8	1,405	90.4	5,624	1,140.4
Louisiana	12,080	59.3	7,162	183.2	99	4.4	1,703	104.6	5,360	1,068.9
Maine	3,436	66.5	2,286	165.3	11	—	318	62.3	1,957	1,116.0
Maryland	**12,144**	**69.2**	**8,404**	**180.8**	**101**	**4.0**	**1,645**	**79.7**	**6,646**	**1,113.3**
Massachusetts	15,907	65.8	10,462	150.7	83	2.8	1,449	60.5	8,930	1,038.7
Michigan	27,804	67.8	18,814	196.6	146	3.0	3,430	90.5	15,237	1,245.3
Minnesota	9,595	68.9	6,615	133.8	49	2.1	915	49.9	5,651	965.3
Mississippi	9,374	59.7	5,593	212.2	78	5.4	1,307	130.7	4,208	1,254.3
Missouri	18,052	65.5	11,819	198.9	89	3.4	1,904	91.5	9,826	1,317.7
Montana	2,055	69.6	1,430	149.9	4	—	215	60.0	1,211	1,032.9
Nebraska	4,517	66.6	3,009	156.9	25	3.0	374	60.6	2,610	1,143.3
Nevada	4,255	62.7	2,668	177.6	23	2.6	700	99.0	1,945	937.7
New Hampshire	2,759	68.0	1,875	164.3	11	—	300	63.0	1,564	1,081.7
New Jersey	23,581	57.6	13,571	156.8	93	2.5	1,906	58.6	11,571	1,044.1
New Mexico	3,486	68.1	2,374	156.2	20	2.3	389	59.2	1,964	982.1
New York	59,199	60.2	35,630	184.6	202	2.3	5,269	74.4	30,157	1,241.2
North Carolina	19,299	61.0	11,765	161.3	117	3.1	2,459	83.8	9,189	962.3
North Dakota	1,844	66.1	1,218	155.5	3	—	173	73.6	1,042	1,127.9
Ohio	33,338	64.5	21,514	185.3	156	2.9	3,525	81.7	17,832	1,187.9
Oklahoma	11,308	58.5	6,612	186.1	52	3.2	1,144	90.3	5,415	1,206.8
Oregon	7,306	71.0	5,189	146.8	43	2.7	815	61.9	4,331	995.4
Pennsylvania	41,838	66.1	27,644	189.5	154	2.8	3,986	85.8	23,502	1,237.6
Rhode Island	3,015	70.0	2,110	170.7	10	—	250	68.1	1850	1,198.6
South Carolina	10,028	62.3	6,247	175.5	92	4.8	1,546	102.8	4,609	973.7
South Dakota	2,031	69.8	1,418	161.7	6	—	200	75.3	1,212	1,149.4
Tennessee	16,358	60.2	9,844	184.6	106	4.0	2,120	97.9	7,618	1,118.7
Texas	43,717	59.5	26,006	162.1	295	2.8	5,192	69.8	20,517	1,017.5
Utah	2,830	72.1	2,039	139.1	30	2.3	284	44.2	1,725	929.4
Vermont	1,349	69.5	938	156.8	8	—	137	55.9	793	1,087.6
Virginia	15,401	59.3	9,130	152.4	106	3.1	1,813	66.8	7,210	930.5
Washington	11,590	67.0	7,763	145.1	55	1.9	1,130	49.9	6,578	1,000.7
West Virginia	6,860	59.0	4,045	193.7	29	3.6	799	110.2	3,217	1,178.8
Wisconsin	13,891	72.9	10,122	179.0	69	2.7	1,349	67.0	8,704	1,258.9
Wyoming	1,013	69.2	701	160.3	3	—	116	60.8	582	1,046.2
Total/Average	728,743	63.4	462,340	175.4	3,976	3.0	78,456	75.4	379,869	1,099.8

*Per 100,000 population.

† Standardized to the 2000 projected U.S. population.

§ Number too small to calculate rate.

Source: Centers for Disease Control and Prevention. State-specific mortality from sudden cardiac death--United States, 1999. *MMWR Morbidity and Mortality Weekly Report*. 2002 Feb 15;51(6):123-6.

Table B-4: Percent of People in Poverty, Income of Household, and Percent of People without Health Insurance Coverage for the Entire Year by State: Three-Year Average 1999-2001.

	Percent of People in Poverty			Household Income			Percent of People without Health Insurance Coverage for the Entire Year		
	Percent	90-percent C.I (+/-)	Rank	Median Income (dollars)	90-percent C.I (+/-)	Rank	Percent	90-percent C.I (+/-)	Rank
United States	11.6	0.2		42,873	180		14.5	0.2	
Alabama	14.8	1.5	44	36,693	1,294	42	13.2	0.7	27
Alaska	7.9	1.2	7	55,426	2,103	1	17.7	0.7	44
Arizona	12.9	1.5	37	40,965	1,489	32	18.4	0.8	47
Arkansas	16.3	1.7	48	31,798	1,146	50	15.0	0.7	35
California	13.1	0.7	39	47,243	834	14	19.2	0.3	48
Colorado	9.0	1.1	13	50,053	1,549	8	15.1	0.7	36
Connecticut	7.4	1.1	4	52,887	1,979	3	9.7	0.5	11
Delaware	8.5	1.3	11	50,301	2,099	7	9.5	0.7	9
District of Columbia	16.1	1.8	47	41,539	1,476	30	13.6	0.7	30
Florida	12.0	0.8	31	38,141	732	40	17.8	0.5	45
Georgia	12.6	1.4	34	42,508	1,281	24	15.3	0.7	38
Hawaii	10.4	1.4	27	49,232	1,700	9	9.7	0.7	11
Idaho	12.7	1.5	35	38,310	1,430	39	16.5	0.7	42
Illinois	10.2	0.9	22	47,578	1,140	13	13.6	0.5	30
Indiana	7.9	1.1	7	41,921	1,352	28	10.8	0.5	17
Iowa	7.7	1.1	5	42,255	1,199	26	8.0	0.5	3
Kansas	10.1	1.3	21	41,097	1,764	31	11.4	0.7	22
Kentucky	12.4	1.4	32	37,184	1,325	41	13.0	0.7	25
Louisiana	17.5	1.7	50	33,194	1,274	48	19.7	0.8	49
Maine	10.3	1.3	25	38,733	1,236	36	10.7	0.7	16
Maryland	**7.3**	**1.1**	**3**	**55,013**	**2,079**	**2**	**11.3**	**0.7**	**21**
Massachusetts	10.2	1.1	22	49,018	1,935	11	8.7	0.5	5
Michigan	9.7	0.9	17	46,929	1,195	15	9.9	0.3	14
Minnesota	6.8	1.0	2	52,804	1,765	4	7.8	0.5	2
Mississippi	16.8	1.8	49	33,305	1,570	47	15.2	0.7	37
Missouri	10.2	1.3	22	43,884	1,414	20	8.8	0.5	7
Montana	14.4	1.7	43	32,929	1,086	49	16.0	0.8	41
Nebraska	9.7	1.3	17	42,518	1,379	23	9.6	0.5	10
Nevada	9.0	1.2	13	45,493	1,556	17	17.2	0.7	43
New Hampshire	6.2	1.1	1	50,866	1,640	6	9.0	0.5	8
New Jersey	7.7	0.8	5	52,137	1,328	5	12.5	0.5	24
New Mexico	18.8	1.9	51	34,599	1,681	45	23.2	0.8	51
New York	14.1	0.8	41	42,157	819	27	15.8	0.3	40
North Carolina	12.9	1.2	37	39,040	1,065	35	14.2	0.5	33
North Dakota	12.4	1.5	32	35,830	1,314	44	10.9	0.7	20
Ohio	10.8	0.9	29	42,631	951	22	10.8	0.3	17
Oklahoma	14.3	1.5	42	34,554	1,186	46	17.9	0.7	46
Oregon	11.8	1.4	30	42,701	1,184	21	13.1	0.7	26
Pennsylvania	9.2	0.8	16	42,320	1,025	25	8.7	0.3	5
Rhode Island	10.0	1.3	20	44,825	1,665	19	7.2	0.5	1
South Carolina	12.7	1.5	35	38,362	1,479	38	13.3	0.7	28
South Dakota	9.0	1.2	13	38,407	974	37	10.4	0.5	15
Tennessee	13.2	1.5	40	36,542	1,218	43	10.8	0.7	17
Texas	15.2	0.9	45	40,547	948	33	23.0	0.5	50
Utah	8.0	1.1	9	48,378	1,657	12	13.6	0.7	30
Vermont	9.8	1.3	19	41,888	1,302	29	9.7	0.7	11
Virginia	8.0	1.1	9	49,085	1,587	10	11.9	0.7	23
Washington	10.4	1.3	27	44,835	1,823	18	13.5	0.7	29
West Virginia	15.6	1.5	46	30,342	990	51	14.2	0.7	33
Wisconsin	8.6	1.1	12	46,734	1,583	16	8.5	0.5	4
Wyoming	10.3	1.4	25	40,007	1,379	34	15.6	0.7	39

Source: U.S. Census Bureau, Current Population Survey, 2000, 2001, and 2002 Annual Demographic Supplements.

Reports: Proctor, Bernadette D. and Joseph Dalaker, U.S. Census Bureau, Current Population Reports, P60-219, *Poverty in the United States: 2001*, U.S. Government Printing Office, Washington, DC, 2002.

DeNavas-Walt, Carmen and Robert Cleveland, U.S. Census Bureau, Current Population Reports, P60-218, *Money Income in the United States: 2001*, U.S. Government Printing Office, Washington, DC, 2002.

Robert J. Mills, U.S. Census Bureau, Current Population Reports, P60-220, *Health Insurance Coverage: 2001*, U.S. Government Printing Office, Washington, DC, 2002.

Table B-5: Deaths Due to Diseases of the Heart: 2001.

State	Number	Rate†	Rank
Alabama	13,207	289.3	46
Alaska	603	187.7	5
Arizona	10,588	204.5	10
Arkansas	8,263	279.1	43
California	68,234	230.4	23
Colorado	6,293	181.0	3
Connecticut	8,582	216.4	16
Delaware	2,033	257.2	35
District of Columbia	1,761	308.5	50
Florida	50,629	233.2	26
Georgia	17,478	268.0	38
Hawaii	2,310	179.5	2
Idaho	2,489	205.1	11
Illinois	30,990	251.5	31
Indiana	15,682	258.0	37
Iowa	8,250	224.0	21
Kansas	6,716	224.0	21
Kentucky	11,808	294.0	47
Louisiana	11,474	280.1	44
Maine	3,272	218.8	18
Maryland	**12,310**	**251.6**	**32**
Massachusetts	15,144	210.4	13
Michigan	26,896	273.8	41
Minnesota	8,760	171.0	1
Mississippi	9,050	329.0	51
Missouri	16,633	271.9	40
Montana	1,970	197.9	7
Nebraska	4,150	210.9	14
Nevada	4,393	257.1	34
New Hampshire	2,835	230.9	24
New Jersey	22,704	250.8	30
New Mexico	3,423	203.4	9
New York	56,643	282.2	45
North Carolina	18,792	244.0	28
North Dakota	1,700	210.9	14
Ohio	32,453	271.0	39
Oklahoma	10,840	298.1	49
Oregon	7,075	191.6	6
Pennsylvania	39,438	257.8	36
Rhode Island	3,076	240.5	27
South Carolina	9,471	245.5	29
South Dakota	1,985	218.1	17
Tennessee	15,688	278.2	42
Texas	43,199	255.1	33
Utah	2,896	185.2	4
Vermont	1,429	221.4	19
Virginia	14,913	231.9	25
Washington	11,281	201.2	8
West Virginia	6,325	296.0	48
Wisconsin	13,023	222.3	20
Wyoming	985	209.5	12
United States	**700,142**	**247.8**	

ICD-10-CM codes: I00–I09, I11, I13, I20-I51.
† Deaths per 100,000 population, age-adjusted to 2000 total U.S. population.
Source: Arias E, Anderson RN, Hsiang-Ching K, Murphy SL, Kochanek KD. *Deaths: Final data for 2001*. National vital statistics reports; vol 52 no 3. Hyattsville, Maryland: National Center for Health Statistics. 2003. (http://www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_03.pdf)

Table B-6: Obesity by Body Mass Index* in Maryland and United States: 1990-2001.

	Maryland %	USA Median %
1990	12.0	11.6
1991	11.6	12.6
1992	12.6	12.6
1993	13.9	13.7
1994	14.7	14.4
1995	16.3	15.8
1996	17.7	16.8
1997	17.5	16.6
1998	20.5	18.3
1999	18.2	19.7
2000	20.2	20.1
2001	20.5	21.0

Source: CDC, Behavioral Risk Factor Surveillance System, 2003.
Maryland percentage obese; United States median percent of States surveyed (includes District of Columbia and Puerto Rico in years >1995; Guam and Virgin Islands in years >2000).
*All respondents 18 and older who report that their Body Mass Index (BMI) is 30.0 or more. BMI is defined as weight in kilograms divided by height in meters squared.

Table B-7: Prevalence of Obesity and Diabetes Among U.S. Adults by State, BRFSS 2001.

	Obesity		Diabetes	
State	**%**	**Rank**	**%**	**Rank**
Alabama	23.4	45	10.5	51
Alaska	21.0	31	6.4	11
Arizona	17.9	7	8.3	39
Arkansas	21.7	34	8.9	45
California	20.9	30	8.3	39
Colorado	14.4	1	5.6	4
Connecticut	17.3	4	7.5	27
Delaware	20.0	23	8.2	38
District of Columbia	19.9	21	9.1	46
Florida	18.4	9	10.3	49
Georgia	22.1	39	7.7	29
Hawaii	17.6	6	7.2	24
Idaho	20.0	23	6.3	10
Illinois	20.5	27	8.1	36
Indiana	24.0	47	7.1	21
Iowa	21.8	36	6.1	7
Kansas	21.0	31	6.6	15
Kentucky	24.2	48	7.1	21
Louisiana	23.3	44	8.5	44
Maine	19.0	13	8.0	33
Maryland	**19.8**	**20**	**8.1**	**36**
Massachusetts	16.1	2	6.8	18
Michigan	24.4	49	7.8	31
Minnesota	19.2	17	5.0	1
Mississippi	25.9	51	10.3	49
Missouri	22.5	42	7.3	25
Montana	18.2	8	6.2	9
Nebraska	20.1	26	6.4	11
Nevada	19.1	16	6.5	13
New Hampshire	19.0	13	6.9	20
New Jersey	19.0	13	8.4	42
New Mexico	18.8	11	7.1	21
New York	19.7	19	7.7	29
North Carolina	22.4	41	7.6	28
North Dakota	19.9	21	5.8	5
Ohio	21.8	36	8.0	33
Oklahoma	22.1	39	8.4	42
Oregon	20.7	29	6.6	15
Pennsylvania	21.4	33	7.8	31
Rhode Island	17.3	4	7.3	25
South Carolina	21.7	34	9.4	48
South Dakota	20.6	28	6.8	18
Tennessee	22.6	43	8.3	39
Texas	23.8	46	8.0	33
Utah	18.4	9	5.5	3
Vermont	17.1	3	6.1	7
Virginia	20.0	23	6.7	17
Washington	18.9	12	6.5	13
West Virginia	24.6	50	9.3	47
Wisconsin	21.9	38	5.8	5
Wyoming	19.2	17	5.2	2
Total	20.9		7.9	

Source: http://www.cdc.gov/nccdphp/dnpa/obesity/trend/obesity_diabetes_states.htm; accessed 7/30/2003
Notes: Rank is lowest to highest.
A study published in the January 1, 2003, issue of the *Journal of the American Medical Association (JAMA),* reported that the prevalence of obesity among U.S. adults climbed from 19.8 percent to 20.9 percent between 2000 and 2001, and diagnosed diabetes (including gestational diabetes) increased from 7.3 percent to 7.9 percent during the same one-year period. The increases were evident regardless of sex, age, race, and educational status. In 2001, 20 states had obesity prevalence rates of 15-19 percent; 29 states had prevalences of 20-24 percent; and one state reported a prevalence over 25 percent. In 2001, more than 15 percent of Americans aged 60 or older had diagnosed diabetes. Alabama had the highest prevalence of diagnosed diabetes (10.5 percent) and Minnesota the lowest (5.0 percent). The data in the report were obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a state-based telephone survey that collects information from adults aged 18 years or older. For this survey, participants were asked about their height and weight and if they had ever been told by a doctor that they had diabetes. This table reflects the percentages of individuals who were obese and who had been diagnosed with diabetes within specific geographic areas of the United States (report gives standard error for each). Obesity is defined as having a body mass index (BMI) of 30.0 or more. Prevalence is the number of obese individuals in the population divided by the total number of individuals in the population.
Reference: Mokdad AH, Bowman BA, Ford ES, et al. Prevalence of obesity, diabetes, and obesity related health risk factors, 2001. *JAMA* 2003:289;76–79.

Table B-8: Congestive Heart Failure - as Principal Diagnosis of Maryland Residents
Aged 65 and Older in Maryland and D.C. Hospitals: 1997-2002.

Year	Discharges	Population (Aged 65 and Older)	Rate (per 10,000)
1997	13,025	584,522	222.8
1998	13,011	590,496	220.3
1999	13,133	595,022	220.7
2000	13,406	601,633	222.8
2001	13,618	609,517	223.4
2002	12,916	616,699	209.4

Source: Maryland Discharge Abstract Data, 1997-2002; District of Columbia Inpatient Discharge Data, 1997-2002.
Population Data: 1997-1999 - Intercensal estimates by demographic characteristics (1990-1999), 6/23/03
(http://eire.census.gov/popest/data/states/files/STCH-Intercensal_layout.txt); 2000-2002 - Table ST-EST2002-ASRO-02-24 - State Characteristic
Estimates, 09/18//03 (http://eire.census.gov/popest/data/states/tables/ST-EST2002-ASRO-02-24.xls).

Table B-9: Population by Selected Age Groups for the United States, by State, District of Columbia, and Puerto Rico: 2000.

	Total Population	Under 18 Number	Under 18 Percent	65 and over Number	65 and over Percent	Median Age
United States	281,421,906	72,293,812	25.7	34,991,753	12.4	35.3
Alabama	4,447,100	1,123,422	25.3	579,798	13.0	35.8
Alaska	626,932	190,717	30.4	35,699	5.7	32.4
Arizona	5,130,632	1,366,947	26.6	667,839	13.0	34.2
Arkansas	2,673,400	680,369	25.4	374,019	14.0	36.0
California	33,871,648	9,249,829	27.3	3,595,658	10.6	33.3
Colorado	4,301,261	1,100,795	25.6	416,073	9.7	34.3
Connecticut	3,405,565	841,688	24.7	470,183	13.8	37.4
Delaware	783,600	194,587	24.8	101,726	13.0	36.0
District of Columbia	572,059	114,992	20.1	69,898	12.2	34.6
Florida	15,982,378	3,646,340	22.8	2,807,597	17.6	38.7
Georgia	8,186,453	2,169,234	26.5	785,275	9.6	33.4
Hawaii	1,211,537	295,767	24.4	160,601	13.3	36.2
Idaho	1,293,953	369,030	28.5	145,916	11.3	33.2
Illinois	12,419,293	3,245,451	26.1	1,500,025	12.1	34.7
Indiana	6,080,485	1,574,396	25.9	752,831	12.4	35.2
Iowa	2,926,324	733,638	25.1	436,213	14.9	36.6
Kansas	2,688,418	712,993	26.5	356,229	13.3	35.2
Kentucky	4,041,769	994,818	24.6	504,793	12.5	35.9
Louisiana	4,468,976	1,219,799	27.3	516,929	11.6	34.0
Maine	1,274,923	301,238	23.6	183,402	14.4	38.6
Maryland	**5,296,486**	**1,356,172**	**25.6**	**599,307**	**11.3**	**36.0**
Massachusetts	6,349,097	1,500,064	23.6	860,162	13.5	36.5
Michigan	9,938,444	2,595,767	26.1	1,219,018	12.3	35.5
Minnesota	4,919,479	1,286,894	26.2	594,266	12.1	35.4
Mississippi	2,844,658	775,187	27.3	343,523	12.1	33.8
Missouri	5,595,211	1,427,692	25.5	755,379	13.5	36.1
Montana	902,195	230,062	25.5	120,949	13.4	37.5
Nebraska	1,711,263	450,242	26.3	232,195	13.6	35.3
Nevada	1,998,257	511,799	25.6	218,929	11.0	35.0
New Hampshire	1,235,786	309,562	25.0	147,970	12.0	37.1
New Jersey	8,414,350	2,087,558	24.8	1,113,136	13.2	36.7
New Mexico	1,819,046	508,574	28.0	212,225	11.7	34.6
New York	18,976,457	4,690,107	24.7	2,448,352	12.9	35.9
North Carolina	8,049,313	1,964,047	24.4	969,048	12.0	35.3
North Dakota	642,200	160,849	25.0	94,478	14.7	36.2
Ohio	11,353,140	2,888,339	25.4	1,507,757	13.3	36.2
Oklahoma	3,450,654	892,360	25.9	455,950	13.2	35.5
Oregon	3,421,399	846,526	24.7	438,177	12.8	36.3
Pennsylvania	12,281,054	2,922,221	23.8	1,919,165	15.6	38.0
Rhode Island	1,048,319	247,822	23.6	152,402	14.5	36.7
South Carolina	4,012,012	1,009,641	25.2	485,333	12.1	35.4
South Dakota	754,844	202,649	26.8	108,131	14.3	35.6
Tennessee	5,689,283	1,398,521	24.6	703,311	12.4	35.9
Texas	20,851,820	5,886,759	28.2	2,072,532	9.9	32.3
Utah	2,233,169	718,698	32.2	190,222	8.5	27.1
Vermont	608,827	147,523	24.2	77,510	12.7	37.7
Virginia	7,078,515	1,738,262	24.6	792,333	11.2	35.7
Washington	5,894,121	1,513,843	25.7	662,148	11.2	35.3
West Virginia	1,808,344	402,393	22.3	276,895	15.3	38.9
Wisconsin	5,363,675	1,368,756	25.5	702,553	13.1	36.0
Wyoming	493,782	128,873	26.1	57,693	11.7	36.2
Puerto Rico	3,808,610	1,092,101	28.7	425,137	11.2	32.1

Source: U.S. Census Bureau, Census 2000 Summary File 1.

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Table B-10: Population by Sex for the United States, by State, District of Columbia, and Puerto Rico: 2000.

	Total Population	Male	Female	Male-Female Ratio
United States	281,421,906	138,053,563	143,368,343	96.3
Alabama	4,447,100	2,146,504	2,300,596	93.3
Alaska	626,932	324,112	302,820	107.0
Arizona	5,130,632	2,561,057	2,569,575	99.7
Arkansas	2,673,400	1,304,693	1,368,707	95.3
California	33,871,648	16,874,892	16,996,756	99.3
Colorado	4,301,261	2,165,983	2,135,278	101.4
Connecticut	3,405,565	1,649,319	1,756,246	93.9
Delaware	783,600	380,541	403,059	94.4
District of Columbia	572,059	269,366	302,693	89.0
Florida	15,982,378	7,797,715	8,184,663	95.3
Georgia	8,186,453	4,027,113	4,159,340	96.8
Hawaii	1,211,537	608,671	602,866	101.0
Idaho	1,293,953	648,660	645,293	100.5
Illinois	12,419,293	6,080,336	6,338,957	95.9
Indiana	6,080,485	2,982,474	3,098,011	96.3
Iowa	2,926,324	1,435,515	1,490,809	96.3
Kansas	2,688,418	1,328,474	1,359,944	97.7
Kentucky	4,041,769	1,975,368	2,066,401	95.6
Louisiana	4,468,976	2,162,903	2,306,073	93.8
Maine	1,274,923	620,309	654,614	94.8
Maryland	**5,296,486**	**2,557,794**	**2,738,692**	**93.4**
Massachusetts	6,349,097	3,058,816	3,290,281	93.0
Michigan	9,938,444	4,873,095	5,065,349	96.2
Minnesota	4,919,479	2,435,631	2,483,848	98.1
Mississippi	2,844,658	1,373,554	1,471,104	93.4
Missouri	5,595,211	2,720,177	2,875,034	94.6
Montana	902,195	449,480	452,715	99.3
Nebraska	1,711,263	843,351	867,912	97.2
Nevada	1,998,257	1,018,051	980,206	103.9
New Hampshire	1,235,786	607,687	628,099	96.8
New Jersey	8,414,350	4,082,813	4,331,537	94.3
New Mexico	1,819,046	894,317	924,729	96.7
New York	18,976,457	9,146,748	9,829,709	93.1
North Carolina	8,049,313	3,942,695	4,106,618	96.0
North Dakota	642,200	320,524	321,676	99.6
Ohio	11,353,140	5,512,262	5,840,878	94.4
Oklahoma	3,450,654	1,695,895	1,754,759	96.6
Oregon	3,421,399	1,696,550	1,724,849	98.4
Pennsylvania	12,281,054	5,929,663	6,351,391	93.4
Rhode Island	1,048,319	503,635	544,684	92.5
South Carolina	4,012,012	1,948,929	2,063,083	94.5
South Dakota	754,844	374,558	380,286	98.5
Tennessee	5,689,283	2,770,275	2,919,008	94.9
Texas	20,851,820	10,352,910	10,498,910	98.6
Utah	2,233,169	1,119,031	1,114,138	100.4
Vermont	608,827	298,337	310,490	96.1
Virginia	7,078,515	3,471,895	3,606,620	96.3
Washington	5,894,121	2,934,300	2,959,821	99.1
West Virginia	1,808,344	879,170	929,174	94.6
Wisconsin	5,363,675	2,649,041	2,714,634	97.6
Wyoming	493,782	248,374	245,408	101.2
Puerto Rico	3,808,610	1,833,577	1,975,033	92.8

Source: U.S. Census Bureau, Census 2000 Summary File 1.

Table B-11: Population by Race for the United States, by States, and for Puerto Rico: 2000

	Total Population	One Race												Two or More Races	
		White		Black or African American		American Indian or Alaska Native		Asian		Native Hawaiian or Other Pacific Islander		Some Other Race			
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
United States	281,421,906	211,460,626	75.1	34,658,190	12.3	2,475,956	0.9	10,242,998	3.6	398,835	0.1	15,359,073	5.5	6,826,228	2.4
Alabama	4,447,100	3,162,808	71.1	1,155,930	26.0	22,430	0.5	31,346	0.7	1,409	-	28,998	0.7	44,179	1.0
Alaska	626,932	434,534	69.3	21,787	3.5	98,043	15.6	25,116	4.0	3,309	0.5	9,997	1.6	34,146	5.4
Arizona	5,130,632	3,873,611	75.5	158,873	3.1	255,879	5.0	92,236	1.8	6,733	0.1	596,774	11.6	146,526	2.9
Arkansas	2,673,400	2,138,598	80.0	418,950	15.7	17,808	0.7	20,220	0.8	1,668	0.1	40,412	1.5	35,744	1.3
California	33,871,648	20,170,059	59.5	2,263,882	6.7	333,346	1.0	3,697,513	10.9	116,961	0.3	5,682,241	16.8	1,607,646	4.7
Colorado	4,301,261	3,560,005	82.8	165,063	3.8	44,241	1.0	95,213	2.2	4,621	0.1	309,931	7.2	122,187	2.8
Connecticut	3,405,565	2,780,355	81.6	309,843	9.1	9,639	0.3	82,313	2.4	1,366	-	147,201	4.3	74,848	2.2
Delaware	783,600	584,773	74.6	150,666	19.2	2,731	0.3	16,259	2.1	283	-	15,855	2.0	13,033	1.7
District of Columbia	572,059	176,101	30.8	343,312	60.0	1,713	0.3	15,189	2.7	348	0.1	21,950	3.8	13,446	2.4
Florida	15,982,378	12,465,029	78.0	2,335,505	14.6	53,541	0.3	266,256	1.7	8,625	0.1	477,107	3.0	376,315	2.4
Georgia	8,186,453	5,327,281	65.1	2,349,542	28.7	21,737	0.3	173,170	2.1	4,246	0.1	196,289	2.4	114,188	1.4
Hawaii	1,211,537	294,102	24.3	22,003	1.8	3,535	0.3	503,868	41.6	113,539	9.4	15,147	1.3	259,343	21.4
Idaho	1,293,953	1,177,304	91.0	5,456	0.4	17,645	1.4	11,889	0.9	1,308	0.1	54,742	4.2	25,609	2.0
Illinois	12,419,293	9,125,471	73.5	1,876,875	15.1	31,006	0.2	423,603	3.4	4,610	-	722,712	5.8	235,016	1.9
Indiana	6,080,485	5,320,022	87.5	510,034	8.4	15,815	0.3	59,126	1.0	2,005	-	97,811	1.6	75,672	1.2
Iowa	2,926,324	2,748,640	93.9	61,853	2.1	8,989	0.3	36,635	1.3	1,009	-	37,420	1.3	31,778	1.1
Kansas	2,688,418	2,313,944	86.1	154,198	5.7	24,936	0.9	46,806	1.7	1,313	-	90,725	3.4	56,496	2.1
Kentucky	4,041,769	3,640,889	90.1	295,994	7.3	8,616	0.2	29,744	0.7	1,460	-	22,623	0.6	42,443	1.1
Louisiana	4,468,976	2,856,161	63.9	1,451,944	32.5	25,477	0.6	54,758	1.2	1,240	-	31,131	0.7	48,265	1.1
Maine	1,274,923	1,236,014	96.9	6,760	0.5	7,098	0.6	9,111	0.7	382	-	2,911	0.2	12,647	1.0
Maryland	**5,296,486**	**3,391,308**	**64.0**	**1,477,411**	**27.9**	**15,423**	**0.3**	**210,929**	**4.0**	**2,303**	**-**	**95,525**	**1.8**	**103,587**	**2.0**
Massachusetts	6,349,097	5,367,286	84.5	343,454	5.4	15,015	0.2	238,124	3.8	2,489	-	236,724	3.7	146,005	2.3
Michigan	9,938,444	7,966,053	80.2	1,412,742	14.2	58,479	0.6	176,510	1.8	2,692	-	129,552	1.3	192,416	1.9
Minnesota	4,919,479	4,400,282	89.4	171,731	3.5	54,967	1.1	141,968	2.9	1,979	-	65,810	1.3	82,742	1.7
Mississippi	2,844,658	1,746,099	61.4	1,033,809	36.3	11,652	0.4	18,626	0.7	667	-	13,784	0.5	20,021	0.7
Missouri	5,595,211	4,748,083	84.9	629,391	11.2	25,076	0.4	61,595	1.1	3,178	0.1	45,827	0.8	82,061	1.5
Montana	902,195	817,229	90.6	2,692	0.3	56,068	6.2	4,691	0.5	470	0.1	5,315	0.6	15,730	1.7
Nebraska	1,711,263	1,533,261	89.6	68,541	4.0	14,896	0.9	21,931	1.3	836	-	47,845	2.8	23,953	1.4
Nevada	1,998,257	1,501,886	75.2	135,477	6.8	26,420	1.3	90,266	4.5	8,426	0.4	159,354	8.0	76,428	3.8
New Hampshire	1,235,786	1,186,851	96.0	9,035	0.7	2,964	0.2	15,931	1.3	371	-	7,420	0.6	13,214	1.1
New Jersey	8,414,350	6,104,705	72.6	1,141,821	13.6	19,492	0.2	480,276	5.7	3,329	-	450,972	5.4	213,755	2.5
New Mexico	1,819,046	1,214,253	66.8	34,343	1.9	173,483	9.5	19,255	1.1	1,503	0.1	309,882	17.0	66,327	3.6
New York	18,976,457	12,893,689	67.9	3,014,385	15.9	82,461	0.4	1,044,976	5.5	8,818	-	1,341,946	7.1	590,182	3.1
North Carolina	8,049,313	5,804,656	72.1	1,737,545	21.6	99,551	1.2	113,689	1.4	3,983	-	186,629	2.3	103,260	1.3
North Dakota	642,200	593,181	92.4	3,916	0.6	31,329	4.9	3,606	0.6	230	-	2,540	0.4	7,398	1.2
Ohio	11,353,140	9,645,453	85.0	1,301,307	11.5	24,486	0.2	132,633	1.2	2,749	-	88,627	0.8	157,885	1.4
Oklahoma	3,450,654	2,628,434	76.2	260,968	7.6	273,230	7.9	46,767	1.4	2,372	0.1	82,898	2.4	155,985	4.5
Oregon	3,421,399	2,961,623	86.6	55,662	1.6	45,211	1.3	101,350	3.0	7,976	0.2	144,832	4.2	104,745	3.1
Pennsylvania	12,281,054	10,484,203	85.4	1,224,612	10.0	18,348	0.1	219,813	1.8	3,417	-	188,437	1.5	142,224	1.2
Rhode Island	1,048,319	891,191	85.0	46,908	4.5	5,121	0.5	23,665	2.3	567	0.1	52,616	5.0	28,251	2.7
South Carolina	4,012,012	2,695,560	67.2	1,185,216	29.5	13,718	0.3	36,014	0.9	1,628	-	39,926	1.0	39,950	1.0
South Dakota	754,844	669,404	88.7	4,685	0.6	62,283	8.3	4,378	0.6	261	-	3,677	0.5	10,156	1.3
Tennessee	5,689,283	4,563,310	80.2	932,809	16.4	15,152	0.3	56,662	1.0	2,205	-	56,036	1.0	63,109	1.1
Texas	20,851,820	14,799,505	71.0	2,404,566	11.5	118,362	0.6	562,319	2.7	14,434	0.1	2,438,001	11.7	514,633	2.5
Utah	2,233,169	1,992,975	89.2	17,657	0.8	29,684	1.3	37,108	1.7	15,145	0.7	93,405	4.2	47,195	2.1
Vermont	608,827	589,208	96.8	3,063	0.5	2,420	0.4	5,217	0.9	141	-	1,443	0.2	7,335	1.2
Virginia	7,078,515	5,120,110	72.3	1,390,293	19.6	21,172	0.3	261,025	3.7	3,946	0.1	138,900	2.0	143,069	2.0
Washington	5,894,121	4,821,823	81.8	190,267	3.2	93,301	1.6	322,335	5.5	23,953	0.4	228,923	3.9	213,519	3.6
West Virginia	1,808,344	1,718,777	95.0	57,232	3.2	3,606	0.2	9,434	0.5	400	-	3,107	0.2	15,788	0.9
Wisconsin	5,363,675	4,769,857	88.9	304,460	5.7	47,228	0.9	88,763	1.7	1,630	-	84,842	1.6	66,895	1.2
Wyoming	493,782	454,670	92.1	3,722	0.8	11,133	2.3	2,771	0.6	302	0.1	12,301	2.5	8,883	1.8
Puerto Rico	3,808,610	3,064,862	80.5	302,933	8.0	13,336	0.4	7,960	0.2	1,093	-	260,011	6.8	158,415	4.2

Source: U.S. Census Bureau, Census 2000 Summary File 1.

Table B-12: Hispanic Population by State and Puerto Rico: 2000.

	Total Population	Hispanic Population	
		Number	Percent
United States	281,421,906	35,305,818	12.5
Alabama	4,447,100	75,830	1.7
Alaska	626,932	25,852	4.1
Arizona	5,130,632	1,295,617	25.3
Arkansas	2,673,400	86,866	3.2
California	33,871,648	10,966,556	32.4
Colorado	4,301,261	735,601	17.1
Connecticut	3,405,565	320,323	9.4
Delaware	783,600	37,277	4.8
District of Columbia	572,059	44,953	7.9
Florida	15,982,378	2,682,715	16.8
Georgia	8,186,453	435,227	5.3
Hawaii	1,211,537	87,699	7.2
Idaho	1,293,953	101,690	7.9
Illinois	12,419,293	1,530,262	12.3
Indiana	6,080,485	214,536	3.5
Iowa	2,926,324	82,473	2.8
Kansas	2,688,418	188,252	7.0
Kentucky	4,041,769	59,939	1.5
Louisiana	4,468,976	107,738	2.4
Maine	1,274,923	9,360	0.7
Maryland	**5,296,486**	**227,916**	**4.3**
Massachusetts	6,349,097	428,729	6.8
Michigan	9,938,444	323,877	3.3
Minnesota	4,919,479	143,382	2.9
Mississippi	2,844,658	39,569	1.4
Missouri	5,595,211	118,592	2.1
Montana	902,195	18,081	2.0
Nebraska	1,711,263	94,425	5.5
Nevada	1,998,257	393,970	19.7
New Hampshire	1,235,786	20,489	1.7
New Jersey	8,414,350	1,117,191	13.3
New Mexico	1,819,046	765,386	42.1
New York	18,976,457	2,867,583	15.1
North Carolina	8,049,313	378,963	4.7
North Dakota	642,200	7,786	1.2
Ohio	11,353,140	217,123	1.9
Oklahoma	3,450,654	179,304	5.2
Oregon	3,421,399	275,314	8.0
Pennsylvania	12,281,054	394,088	3.2
Rhode Island	1,048,319	90,820	8.7
South Carolina	4,012,012	95,076	2.4
South Dakota	754,844	10,903	1.4
Tennessee	5,689,283	123,838	2.2
Texas	20,851,820	6,669,666	32.0
Utah	2,233,169	201,559	9.0
Vermont	608,827	5,504	0.9
Virginia	7,078,515	329,540	4.7
Washington	5,894,121	441,509	7.5
West Virginia	1,808,344	12,279	0.7
Wisconsin	5,363,675	192,921	3.6
Wyoming	493,782	31,669	6.4
Puerto Rico	3,808,610	3,762,746	98.8

Source: U.S. Census Bureau, Census 2000 Summary File 1.